

THE PEOPLE AND THEIR ECONOMIC ACTIVITIES

The people.--The population of Magugu is composed of fifty-five tribes who have come to Magugu from such widely separated areas as the Anglo-Egyptian Sudan and Nyasaland on the north and south, and Zanzibar and the Belgian Congo on the east and west.

The predominant tribe is the Mbugwe, for Magugu is within the old tribal boundary of the Mbugwe chiefdom. Even before Magugu came into existence in 1944, old maps carried the notation that eight Wambugwe families lived in the present Magugu area. Ever since the beginnings of Magugu there has been a slow trickle of Wambugwe coming from their homeland only fifteen miles to the north. In 1954 the area served by the Magugu irrigation ditch included eighty-nine Wambugwe farmsteads.

Five other tribes each contribute over twenty families to the Magugu population complex: thirty-nine Irangi, thirty-three Nyamwezi, thirty-two Iramba, twenty-three Sukuma, and twenty-one Nyaturu. One other tribe, the Makua, is represented by ten families. The remaining tribes number less than ten families each.

This tribal distribution is unusual because such neighboring tribes as the Gorowa, Masai, and Iraqw have extremely small representations at Magugu, and others

such as the Mdaturu (commonly called the Barabaig) have not come to Magugu at all. There are many reasons why some of these tribes have not been attracted to Magugu. Some are content where they are; or they seldom travel; or they are not overcrowded; or they just haven't heard of Magugu. Such a large representation as is made by the Sukuma, who live a great distance away, can be understood better when one examines the overcrowding and soil erosion occurring among the Sukuma, the most populous tribe in Tanganyika, and the ease with which they relocate themselves in alien areas.¹

The great number of tribes in Magugu, with their varied social and economic backgrounds, has markedly influenced the pattern of land utilization at Magugu. Some of these tribes (such as the Mbugwe) are predominantly Christian. The fact that the Christian men are limited to one wife has restricted the size of their agricultural holdings. The Moslem and pagan tribes permit polygamy, and hence a man with plural wives may increase his acreages by merely acquiring additional wives and hoes. The fact that some of the tribes come from the coast, where water is abundant and rice is raised, has enabled these people to teach rice culture to tribesmen, who never would have grown this crop had they not come to Magugu. Tribes from

¹Malcolm, D.W. Sukumaland, An African People and Their Country. London: Oxford University Press, 1953, pp. 107-145.

the drier parts of Africa have brought their skills in raising such drought-resisting crops as millet, cassava, or peanuts. Hence, the varied tribal background of the Africans in Magugu must be kept in mind in understanding the widely different types of crops that are grown in this area.

Some of the farmers of the Magugu area have been there for nearly twenty years. Since the African settlement has been in existence only ten years, these farmers' presence is accounted for by their employment on European farms, the first of which was cleared twenty years ago. However, the average time spent in Magugu by the present inhabitants is seven and one-half years. If these early settlers, who were really not residents of the present Magugu community, are not calculated, then the average period of residence in Magugu is slightly less than five years. This latter average period of occupancy takes into consideration the first evacuees who were moved from Kiru as well as recent arrivals. Of the total population, 123 farmers have lived at Magugu for three or less years, and only twenty-eight farmers claim to have been brought from Kiru in 1943. Hence, Magugu's population in general represents a people who are new on the scene and who are still learning how to adapt themselves to their new environment.

Eighty-six families have lived in the area for periods of eleven to thirty-five years. They represent

either the original Wambugwe settlers, remnants of the old Kiru settlement, or former employees of the Magugu European colony.¹ As only these eighty-six are long time residents of the area, there remain 309 families who are strict aliens in the sense that until recent years they had had no contact with Magugu. It is these new settlers that are beginning to set the pattern of land utilization at Magugu. Governmental power, however, still rests in the hands of the original settlers. That the climax pattern of land use has not been reached is evidenced by the large amount of potentially good farm land still untouched and by the fact that 129 farmers interviewed still have not yet decided whether they will remain permanently at Magugu.²

In June, 1954, there were 395 individual farmers in the Magugu area, and all these farmers were interviewed and their farms examined (Fig. 86). As far as is known, every farm at Magugu was studied. Because no detailed mapping has ever been done at Magugu, these farms, many isolated in the bush, were found by examining aerial photographs or through information given by other farmers.³

¹Some are still employed on European farms but maintain homes and farms of their own.

²It should be noted, however, that in January, 1954, at the beginning of the field work, nearly all farmers interviewed indicated a desire to remain at Magugu for life. By June, 1954, when the failure of rains had ruined many crops, many then said they were planning to leave.

³The aerial photographs were of such quality that all farms were not easily discernible (see Fig. 101).



Fig. 86.--Interviewing a
Magugu farmer. To the right is
the author's interpreter.

It is possible, considering some Africans' penchants for living completely removed from anyone else, that one or two farms were missed. Also a few plots of land farmed by Africans living and employed on European estates were not included. The figure 395 represents farmers with a dwelling of their own, though this dwelling often was not located on the farm itself.

In order to cover efficiently the whole area and to set up convenient units of work, the area of Magugu was divided into the sections used by the Native Authority in governing Magugu.¹ These administrative divisions are not exact ones, but were made so for this study (see Fig. 97). Hence, while laying out the boundaries of these divisions the local headman pointed out lines of demarcation, and for the purposes of this work it was immaterial if the areas were exact---they are merely convenient working units. In analyzing the whole land use pattern, these Native Authority units were ignored in favor of the whole Magugu area. However, they are used to determine certain items such as population distribution and location of farms.

RELIGION

Moslems.--Sixty per cent (237) of the farmers

¹The term "Native Authority", as used here, refers to the local Government set up at Magugu. It consists of a Jumbe (headman), sub-Jumbe, elders, clerks, messengers, and jailer. It is financed by poll taxes and license fees.

interviewed at Magugu are members of the Moslem religion. However, because this group has more wives and children than the Christian element they represent more than 60 per cent of the total population (Fig. 87). The Moslem influence at Magugu is so strong that all the elders and the headman of the village, as well as the schoolmaster and all Native Authority employees, except the clerk, are Moslems (Fig. 88). This has influenced the economic and agricultural life of the community. Friday, not Sunday, is the day of rest. The holy month of Ramizan in May, when no Moslem eats or drinks from sunrise to sunset, is reflected in decreased efficiency of the workers resulting in a tendency to neglect their fields with consequent lower yields.¹ Because May is also the month when many of the crops are ripening for the June and July harvests and need much attention, this month of fasting assumes even greater importance. A Moslem also demands that his meat be slaughtered by a Moslem. Practically the only people with hunting guns at Magugu are Europeans and non-Moslem. The hunters sometimes do not have Moslem assistants with them to slice the animal's throat, and the meat will then be wasted, even though the diet of the Moslem would be greatly improved by this meat. Under these circumstances such

¹This is carried to such an extreme that a good Moslem will not swallow his own spittle during this time.



Fig. 87.--The Jumbe (headman) of Magugu and three of his four wives.



Fig. 88.--Abdu, the author's cook, and one of his wives. In 1954 Abdu had two wives but had made a down payment on a third, a fourteen year old girl. Since then he has acquired a fourth wife.

highly desired meat as buffalo and impala will not be touched, even though it means that hunger will result.

The influence of Moslemism also effects inheritance rights at Magugu. If a Moslem farmer dies at Magugu and leaves no heirs or known relatives, a not uncommon occurrence in an alien community like Magugu, his property is sold and the money is given to the local mosque (Fig. 89). In theory, if a Christian farmer dies under similar circumstances his assets will be turned over to the Christian mission, but in actuality they are usurped by the Moslems.

The fact that the members of the largest tribal element at Magugu, the Wambugwe, are mainly Catholics has led to friction. Even though this is part of the old Mbugwe chiefdom, the Moslem ruling element treat them as interlopers and base their prejudice on the fact that they are cattle people. The headman of the village is quite public in his utterances against the Wambugwe. Claims are made that their cattle are a destructive and disruptive element in a sedentary agricultural community such as Magugu. This is undoubtedly true, for where the Wambugwe have settled, and in general they clannishly settle in close proximity to each other, the land use pattern is radically different from that anywhere else. However, the fact that the Wambugwe with their cattle represent more wealth proportionately than that possessed by the



Fig. 89.--The Moslem mosque.
The main center of worship at Magugu.



Fig. 90.--The new school at
Magugu, completed in 1954. At present
there is only one teacher, a Moslem.

Moslems, as well as the fact the Wambugwe are demanding some sort of voice in Native Authority Government, are more likely truer causes for this friction than the mere possession of great numbers of cattle.

To the suggestion that the Christians be given some sort of representation in the governmental councils of the area, the headman has replied that if the Christians don't like it they can move. In desperation, the Wambugwe are planning to construct a Catholic school at Magugu so that at least their children will not have to be educated by a Moslem school teacher.¹

Pagans.--Twenty-one per cent of those interviewed, or eighty-four families, are pagans. These pagans, who are strongly influenced by their "witch doctors", reflect their religious beliefs in their methods of farming. The "witch doctor" is consulted for a propitious time to plant and harvest crops; sums of money are paid to induce him to

¹The new school at Magugu with an enrollment of about sixty pupils was opened in mid-January, 1954 (Fig. 90). Up to this time there were no public educational facilities at Magugu. The school teacher, a Moslem with very little formal education, was suspicious of the field work being done, and as far as known was the only Magugu resident to place obstacles in the way of the study. This was done by his attempts to induce non-cooperation on the part of the Africans being interviewed. He began to spread stories that the author had come to Magugu only to acquire land for non-African use or to raise taxes. Only an appeal to the headman, who cooperated freely with the study, stopped this agitation when the headman lectured the schoolmaster on his intolerance.

bring rain, to keep away locusts, to make wives fertile, or to perform a wide variety of other functions. As a result, the pagans, upon the advice of the "witch doctor", sometimes have either much better or much worse crops than their non-pagan neighbors, depending upon how successful the "witch doctor" is in picking a planting or harvesting date.

Christians.--Sixty-seven families, or 17 per cent of the population, are Roman Catholics and are represented mainly by the Mbugwe tribe (Fig. 91). The Wambugwe have not integrated themselves well into the Magugu community, for their loyalties still lie only fifteen miles to the north, the capital of the Mbugwe chiefdom. In addition, their possession of large numbers of cattle, as previously mentioned, sets them apart from the rest of the community. Most of them are good Catholics, and their small and primitive church in Magugu is crowded with communicants whenever services are held (Fig. 92). The fact that the only priests at the Mbugwe Mission are Africans has been an added bond to solidify their allegiance to Mbugwe (see Fig. 14).

The remaining families, numbering seven, or 2 per cent of those interviewed, are Protestants. Two of these are Lutherans, undoubtedly the result of missionary activity in their original homes, for there are no Lutheran missionaries at Magugu. The other five families belong to



Fig. 91.--The Catholic Church at Magugu. Note the crude cross on the roof.



Fig. 92.--Waiting for Mass. Catholic women in front of their church waiting for Mass to begin. The vegetation in the background is the castor bean.

the Gospel Furthering Society, a United States-sponsored sect represented by a missionary at Bonga, over twenty miles away. This missionary and his wife occasionally come to Magugu and maintain a small chapel there. At present their proselytizing consists mainly of bringing automobile rides, food and gifts to the African, a not unpopular form of activity, especially when crops are bad.

WIVES, CHILDREN AND DEPENDENTS

Wives.--Though Magugu is predominately Moslem or pagan, both of which permit polygamy, there are only 347 wives in the community representing nine-tenths of a wife per farm operator (Fig. 93). Ninety operators have no wives at all but some of these operators are widowers, some are too young to have acquired the necessary bride wealth, and a few are widows or single women who operate their own farms. This does not indicate an absence of marriageable women in Magugu. On the contrary, since African law permits the marriage of a girl at the age of nine, there are plenty of potential wives in the Magugu area (Fig. 94).¹ However, the fact that the marriage costs have greatly increased in recent times has prohibited many of the younger men from acquiring a wife. The lack of a

¹The law prohibits intercourse with such a young wife until she reaches the age of twelve, a law which the authorities readily admit is not enforceable and is hence constantly broken.



Fig. 93.--A family of Magugu. They are Moslem, but the husband has only one wife. Note the neat adobe house with the well thatched roof. In the background are castor beans and bananas.



Fig. 94.--Some of the unmarried women. They are waiting for their laundry, spread out to the right, to dry.

wife is, of course, reflected in the smaller amount of cultivated acres possessed by an unmarried farmer than that possessed by a married farmer.

A further factor in women not marrying is the ease with which a woman can acquire funds through prostitution. Cattle drovers along the Great North Road stop nearly nightly at Magugu with their herds and provide many customers for the prostitutes. Additional customers are drawn from the workers on the nearby European estates. In addition, travelers often make a point of stopping in Magugu for the same reason, and some of the local Asians also maintain African mistresses. The Asian shopkeepers will tell you that their best dressed customers are usually local prostitutes, and their income produces a sizeable part of the cash income of the Magugu economy. Because prostitution is profitable and easy, many of the prostitutes, who are also independent farm operators, neglect their farming operations. Generally their farms are small and ill-kept, and they depend upon their outside earnings for a livelihood rather than on farm earnings.

Children.--There are 565 children at Magugu. As might be expected, the largest numbers of children generally are in families with more than one wife. Hence, such large families as those with seven to eleven children are invariably from Moslem or pagan households with more than one mother. Sometimes in such families there is now

only one mother, but this is due to either death or desertion on the part of one or more of the mothers. The large families normally are wealthier than small ones, for the father has been able to accumulate the bride price for a number of spouses. In turn, the children can be used as herd boys for livestock or as field hands, and hence they continue to add to their father's assets. Though children cost practically nothing to bear and raise at Magugu, the mere possession of many children is already an indication of wealth.¹

Dependents.--There are 214 adult dependents in the Magugu community. These consist nearly exclusively of relatives who are old and sick, or temporarily down on their luck. Some of these dependents, however, contribute to the support of the family by engaging in agricultural activity, handiwork, caring for children, or supervising the making of African beer. Some are able-bodied and young but are living off their relatives until the relative's assets are gone (Fig. 96). Others work full time for other Africans, on European farms, or as traders. These latter are a type of paying guest, though the farmers still consider them as dependents, as they seldom pay their whole way.

¹Not only is there no fee for childbirth, as a doctor is not hired, but also clothes are often not put on the child until it is three or four years old (Fig. 95).



Fig. 95.--A small child. The small children of Magugu commonly wear no clothes at all.



Fig. 96.--On the left is one of the Magugu farmers; to his right are two of his brothers who are his dependents. The small boy will live with him until he is grown; the older brother may stay as long as he gets housing and food.

Total population.--Therefore, there are 395 individual farm operators in Magugu, 347 wives, 565 children, and 214 dependents, or a total of 1,521 people. This, however, does not represent the whole population of the complete Magugu community. The laborers on the European farms near Magugu, many of whom have small plots of land of their own, number approximately 575 men. As they do nearly all their trading at Magugu, they must be considered an integral part of the community, even though they are in a constant state of flux. Furthermore, some of these laborers eventually settle permanently at Magugu, and it is this source that provides at present the largest number of immigrants to the area. In addition, the Magugu community is bordered on the south by the fertile European Dudumera Estates which employ at any given time about eight hundred laborers. The majority of these laborers also trade at Magugu. There are also the nearby European farmers of Magugu and Dudumera, numbering eleven families (all with wives, children, and sometimes managers). Besides there are two Asian farmers and a handful of Asian and African traders and fisherman who do no farming at all. Hence, the effective population of the Magugu area can be reckoned at about three thousand people, of whom the overwhelming percentage is African.

ADMINISTRATIVE DIVISIONS OF MAGUGU

In order to administer efficiently nearly three

thousand people, the local Native Authority has divided the Magugu community into eighteen smaller divisions (Fig. 97). These are not purely arbitrary divisions, but are commonly the result of names given to various local regions by the Africans over a period of years. Hence, for example, there is no region referred to as Magugu by the African. There is a section known as Magugu Kalimaji, which represents the area first settled by Wambugwe settlers before the modern resettlement scheme was completed (Fig. 98). It is the first part of this term that is used by the Government to refer to the whole community.

The term Magugu is seldom used by anyone in the locality, including Europeans.¹ Instead the trading center is called Kibaoni, or "The Place of the Sign" (Fig. 99). Kibaoni, like all these regions, has definite physical boundaries, though often these boundaries are nebulous ones. Hence, the headman of the village in pointing out a boundary might base the line from certain rocks to a baobab tree. In one instance the baobab tree had blown down and was rotting, but it still formed the mark between two regions.

Some names for these regions are old ones; others are quite new. Kibaotatu, which means "The Place of the Three Signs", got its name only because three markers

¹In Swahili, the word Magugu would be translated to mean the equivalent of a tall reed similar to our "cat tail".

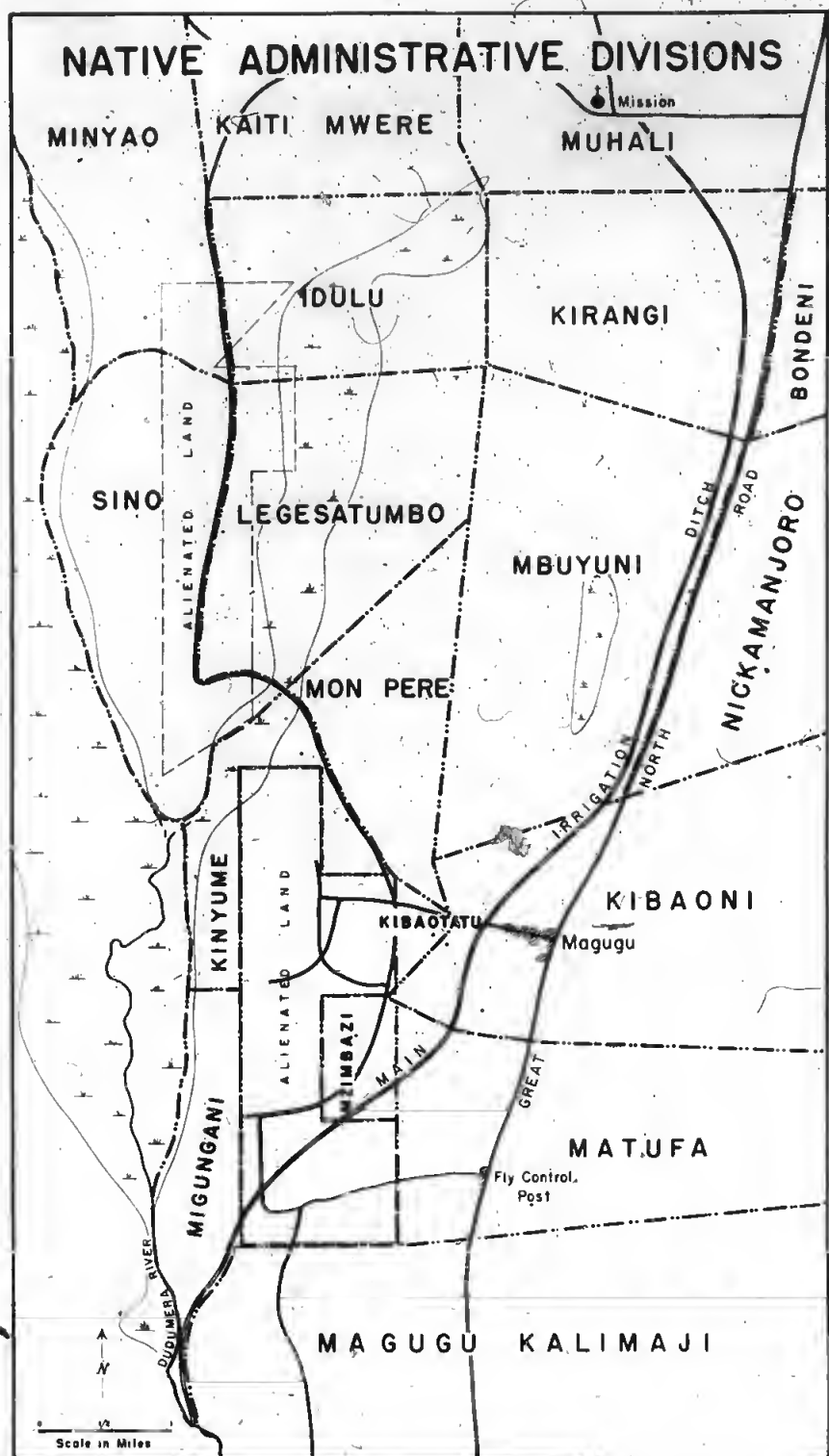


Fig. 97

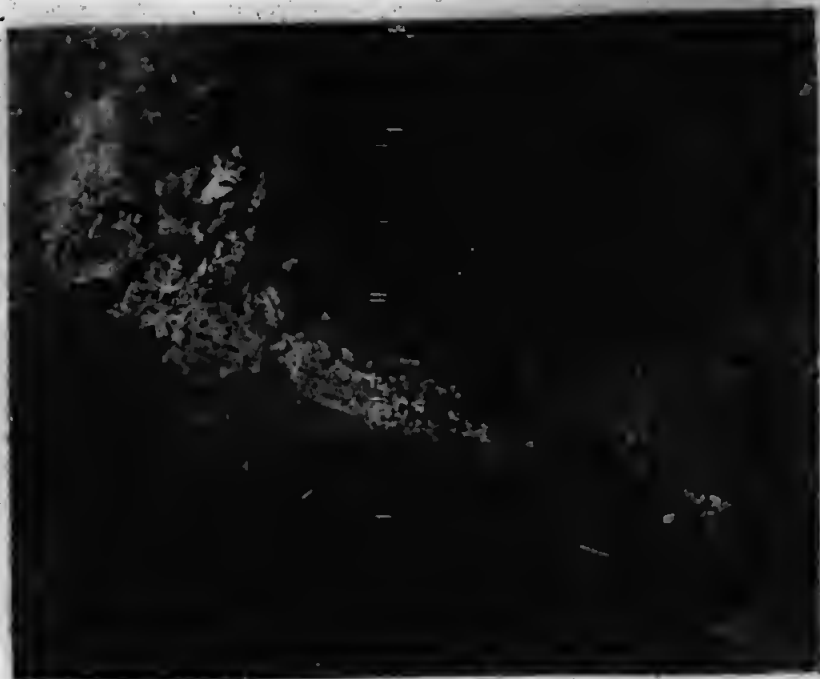


Fig. 98.--The extreme southern boundary of Magugu. The Dudumera River, the dark curving line in the photo, marks the boundary of the administrative division of "Magugu Kalimaji". The small fields are rice and sugar cane. Just to the right of the fields can be seen a faint line running from the river to the top center of the picture. This is the beginning of the main irrigation ditch. Directly to the west of the fields marks the beginning of the large Tindiga Swamp into which the Dudumera River empties. (Photo courtesy of the Air Survey Division, Department of Lands and Surveys, Dar es Salaam, Tanganyika)



Fig. 99.--Kibaoni, or "The Place of the Sign". This is the trading center of Magugu.



Fig. 100.--Kibaotatu, or "The Place of the Three Signs", one of Native Administrative areas of Magugu.

point the way to various estates (Fig. 100). Mon Pere (now generally corrupted to Mompeya) is a remnant of a past era when a French-speaking priest lived at the Mbugwe Mission. Sino and Besi (the latter generally now called Muhali) refer to two hills; Matufa to a small lake (Fig. 101). Already some parts of the extreme southern part of the area are being referred to as Dudumera, after both the river and European estates in that area. It is the sum total of these areas which, in this paper and by the Tanganyika Government, is called Magugu. These eighteen divisions not only permit the local tax authorities to keep better track of the inhabitants but also are useful in assigning quotas for such community work projects as clearing, regenerating bush, road work, or repairing the irrigation ditch.

ENFORCED LABOR AND WATER ALLOCATION

One of the elements determining actual land utilization at Magugu is the effective labor force. This labor force is affected by the present policy of enforced labor on various community projects.

Clearing the main irrigation ditch.--At least once a year the vegetation must be removed from the main irrigation ditch.¹ To accomplish this work the Native Authority officials impress the required number of laborers

¹With proper care this task should be done much oftener.



Fig. 101.--Besi Hill. To the left center is Besi Hill. South of the hill is the area named Besi or Muhali. The road to the right is the Great North Road. The road running from Besi Hill to the Great North Road marks the northern border of the area served by the Magugu irrigation ditch, which ends just to the right of Besi Hill. Most of the cultivated fields are millet (Photo courtesy of the Air Survey Division, Department of Lands and Surveys, Dar es Salaam, Tanganyika).

from the able bodied labor force. Hence, in 1951, 1,005 man-days were spent on the ditch. In 1952, 1,376 man-days were expended, and in 1953, 2,052 man-days. This acceleration of the amount of labor spent on the ditch reflects the increasing deterioration of this all-important water life line to the community. Erosion is washing out the banks; original diversion dams have disappeared; and in places the vegetation impedes the water to such a degree that for long periods of time the water can not filter through fast enough to reach the northern, or farthest, end of the ditch (see Figs. 54, 55, 56, and 57). Though there are 395 farmers at Magugu, many are aged, infirm, women, or are absent from the community for long periods of time. Hence, only 166 laborers worked on the ditch at some time or another over this three year period.

In 1953, these 166 laborers, who represent the best of the labor force, averaged sixteen days of work per man on the irrigation ditch alone. Many of these complain that this is an unfair distribution of labor, and that all should share equally in this work. However, such enforced labor does not affect appreciably the agricultural production of these workers, for such work is carried out during the dry season, when no planting or harvesting is done. It does mean that these workers have less time to spend in improving their own irrigation ditches, in constructing rice paddies, or in improving their homes and out buildings.

There does not seem to be an attempt by the Native Authorities to impress any farmers who do not receive appreciable amounts of water for irrigation purposes. Hence, the Wambugwe, if they are strictly cattle and millet raisers, seldom if ever work on the irrigation ditch. It is the heavy water users, such as rice growers, who do most of the main ditch work, and those who merely use the water for personal or animal use generally escape this labor.

Subsidiary ditches.--The rather elaborate system of subsidiary irrigation ditches needs constant cleaning and repairing (Fig. 102). Such work is never done with impressed labor. If a man is the sole user of a subsidiary ditch he, of course, assumes the entire maintenance of that ditch. If, however, he shares the ditch with other farmers, cooperative work schemes are used to maintain such a joint ditch. It is customary for all users of a ditch to appoint a given day or days when they bring their tools together and perform this work.

The problem of maintaining a major subsidiary ditch from which many minor ditches flow is more complicated (such as the Mon Pere ditch which is over two miles long). Unless the Native Authority forces cooperative action on the part of the many users, the ditch is left untended. As a result, such a ditch as the Mon Pere one is so badly in need of cleaning and repairs that practically

IRRIGATION NETWORK OF MAGUGU

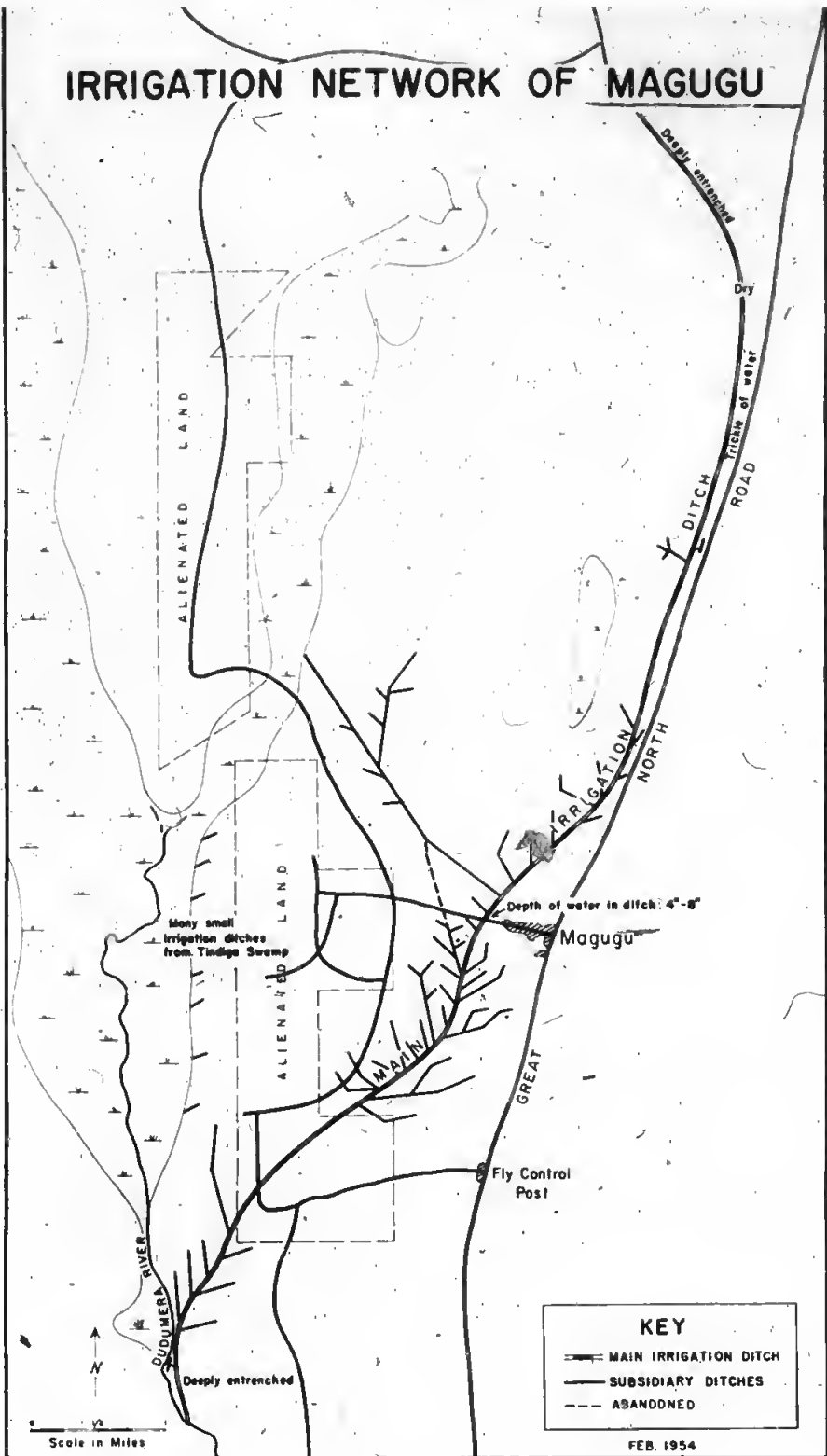


Fig. 102

no water flows through it today. Rice fields depending on the ditch withered and died in 1954. The Mon Pere farmers placed all the blame on the headman of the village for not allowing them their proper share of the water. When it was pointed out to them that not only was the ditch clogged with vegetation and debris but also that the walls of the ditch had crumbled permitting the water to flow over the road, they admitted something would have to be done. But at the end of the growing season in June, no work had yet been started.

Allocation of water.--Often complaints are heard regarding the allocation of water from the main irrigation ditch. Charges are made that unless bribes are paid to the ditch supervisor, who is appointed by the headman, the farmer does not get his share of water. The headman refutes this and claims that there is "equal distribution" of all water. He further claims that those who complain do so only because they are attempting to cultivate too much, especially during the dry season when rains cannot supplement the water from the ditch.

There is an element of truth in both sides of the question. However, there is certainly no system of "equal distribution". It would be more accurate to say that an attempt is made to supply the total needs of each farmer in the order in which his farm is located along the ditch. Those farmers to the south of the trading settlement, and

near the source of the ditch, are favored. Here the largest rice paddies are located; the headman, with his eleven acres of irrigated corn, also lives to the south of the Kibaoni trading settlement. The tendency, therefore, has been for the population to move south of the settlement near the source of the water. Those at the northern end often receive no water at all from the ditch even at the height of the rainy season (see Fig. 102). Part of the reason for this is the failure to keep the ditch cleaned and repaired.

Some farmers plant at a time when their crops will mature so late as not to get the benefit of the rains. This practice bolsters the argument that it is the farmers' own fault for depending upon the ditch when there will be little or no water in it.

That bribes and favoritism play their role in water allocation is also true. When this becomes flagrant enough, as it nearly now is, the situation undoubtedly will be brought out into the open and solved by the Africans themselves, for the African has usually been successful in settling such matters out of court.

Clearing regenerating bush.--A problem other than irrigation ditch care, that of clearing regenerating bush, also requires annual communal labor (Fig. 103). Some slashing and trimming of bush must be done yearly. In 1951, 1,324 man-days were spent on this type of work. In



Fig. 103.--An aerial view of the eastern part of Magugu. The clearing line is shown east of the road where the vegetation darkens in color. Close observation will reveal fields that are too close to the clearing line and which are undoubtedly subject to tsetse fly infestation. In the upper left corner can be seen the beginning of the European farms. The north-south highway is the Great North Road (Photo courtesy of the Air Survey Division, Department of Lands and Surveys, Dar es Salaam, Tanganyika).

1952, 1,910 days, and in 1953, 2,586 days were expended.¹ The labor for this work was performed, during one or all of the past three years, by 137 farmers who, for example, spent nineteen man-days each in 1953 on slashing and clearing work.

Like the irrigation ditch work, each year more time is spent on clearing work. Even so, the farmers are not keeping up with the annual growth of the vegetation, and, if Magugu is to remain tsetse free, increased amounts of labor will have to be used. As much of the clearing work is far away from the existing farms and such work therefore does not seem to have the pressing urgency involved in maintaining a water supply, this type of work has always been unpopular, and laborers for it are hard to recruit. To insure a supply of workers the Native Authority has set up a schedule of fines for those who fail to do their share, but legitimate excuses, such as sickness or absence from the community, relieve many farmers from performing this task. At the present, the rate of regeneration has been so fast that fears are felt for the safety of the community, and occasionally a tsetse fly will be caught in Kibaoni itself. In 1954, plans were being made to enlist the help of the Wambugwe to the north with the slashing work on the grounds that as their grazing

¹It should be pointed out that enforced labor on the ditch or clearings returns no monetary compensation to the worker.

lands benefit by this work, they too should share in it.

Road work.--Another community-type work project involves clearing the vegetation and filling in the holes on the local roads. However, since this should be done by the Public Works Department, laborers on this project are semi-volunteers and are paid a small wage for their services by the Government.

As the only tool used on the roads is the hoe, and the only materials available for the roadbed is soil found along the road, the roads are getting progressively worse. Whenever it rains, detours must be made into adjacent fields and bush to avoid potholes on the road, and only a four wheel drive vehicle can get through. Bridges, built ten years ago, have received no attention. As a result, boards are loose or missing, and several bridges are all but impassable. The general condition of the roads is worsened by careless irrigation which floods the roads or by tractors going over them, especially during the rainy season.¹ For example, road conditions have gotten so bad that unless Mr. Gritzalis of Sino Estate had provided many man-days of labor from his own labor force, the Sino-Magugu road would now be impassable. This road, a number of years ago, became so bad that the cotton ginnery at Idulu had to be shut down because cotton could not be brought

¹Ninety per cent of all vehicular traffic on the roads of Magugu is accounted for by the local Europeans and Asians. Hence, the African is little concerned with the condition of the roads.

to it (Fig. 104). One of the immediate problems of Magugu, if its local farmers are not to become completely isolated in the rainy season, is a thorough rehabilitation of its local road network.

GRAZING-HERDING SYSTEM

Livestock numbers.---There are 3,385 head of livestock owned by Magugu farmers. Of this number, 873 are cattle, 1,231 are goats, 1,250 are sheep, and 31 are donkeys. As this gives an average of 8.5 head of livestock per farmer, it would appear that most Magugites were livestock owners. This is far from the case. Two hundred thirty-five farmers have no livestock of any kind. Hence, all livestock rests in the hands of 160 operators. Consequently the individual herds are generally of good size and would average a little over twenty-one animals per herd.

As would be expected in a newly-developing community with limited capital, the first livestock herds developed consisted primarily of goats and sheep. In Magugu goats and sheep also offered somewhat more resistance to the tsetse fly than did cattle. At the present time, 118 farmers out of the 160 livestock owners own or care for cattle (Fig. 105). Only thirty-eight of these cattle owners possessed cattle before 1950, but between 1950 and 1954, eighty additional farmers acquired cattle, a reflection of the influx of cattle-owning Wambugwe (Figs. 106 and 107). This rapid increase in cattle has raised a



Fig. 104.--The abandoned cotton ginnery at Idulu; in the Idulu district of Magugu. Like most of the local Magugu roads, the road here seldom receives care of any kind.



Fig. 105.--African owned cattle.
The color of the animal and the size of
the horns are generally more prized than
the size of the animal.



Fig. 106.--Wambugwe huts in Matufa.
These huts are large in order to accommo-
date cattle at night, a protective measure
against wild animals.



Fig. 107.--Another hut of the Wambugwe. Note how closely the vegetation is grazed by the livestock. Regeneration of bush is impossible here.



Fig. 108.--Lush grazing grounds northwest of Magugu. These cannot be utilized because of the tsetse fly. Near the light spot in the middle of the photo are some elephants.

number of problems for the Magugu community. Increasingly, farmers are moving from existing farms to escape damages caused by livestock herds. In turn, new settlers are choosing their farms with an eye to how much damage they might expect from livestock.

Allocation of grazing lands.--The further problem of allocation and use of grazing lands has now come to the fore. Five years ago livestock were grazed at will wherever grass was available, and there was normally plenty of it and no competing herds for this grass. Today this is no longer true. The settlers of Magugu are now restricted from going southward with their herds by the Dudumera Estates, and northward they encounter the overgrazed lands of the Wambugwe. To the east lie the Masai plains where no Maguguite would dare take his herds, for the Masai would steal or kill all cattle that came onto their grazing lands. And, of course, to the west lies the Tindiga Swamp and the Rift Wall. Furthermore, forested grazing land surrounding Magugu cannot be used because of the tsetse fly (Fig. 108).

The problem of allocation and conservation of grazing lands, while a pressing one, has not been squarely met by the Native Authority. At present only one method of conservation is used and respected by the livestock owners: this is the conserving of the mbugas for dry season grazing. The mbugas, which become flooded in the rainy

season, produce excellent grazing later on in the year when the other grazing lands are dry and denuded. Nevertheless, the large Burungi and Matufa mbugas, plus the remaining small mbugas, do not provide an adequate cushion for the dry season, and by the time the rains again fall the animals are so emaciated and weakened that many sicken and die. This condition is accentuated by the fact that cattle must compete for the available grass with the close-grazing sheep and goats.

Because of the shortage of grass, there is a tendency for the herders to take their animals, as the dry season advances, into the four hundred yard safety zone (and even beyond) of tsetse-free grazing that borders the uncleared bush areas. As a result, thirty-five incidences of animal sleeping sickness, representing the deaths of 109 cattle, two donkeys, two sheep, and two goats (or over 3 per cent of the total livestock population), have occurred during the past three years.

The time has now arrived for some sort of artificial restrictive measure to keep down the livestock population of the area. This need is emphasized by the fact that up to the present time the farmer at Magugu has not been convinced by agricultural officers that he should cut hay for the dry season, improve his grasses with new varieties or fertilizers, or cull his herds.

Herding system.---The herding system developed at Magugu represents the farmer's adaptation to local physical

conditions. As there are no livestock-retaining fences in the area, the chaos created by 160 operators herding different groups of livestock would be so great that the non-livestock people would not permit it.¹ In addition, so many herds, each competing for limited grazing space, leads to overgrazing. Consequently, a type of cooperative herding system is employed by eighty-three (or over 50 per cent) of the livestock farmers. Groups of farmers, ranging in number from five to twenty, herd their animals in one group with one or two herders in charge. The animals are gathered together each morning and returned each night to their individual owners. Under such an arrangement it is common for each owner to be responsible for the herd a given number of days. This responsibility is then rotated among all the owners.

Only thirty owners of livestock herd their own animals, and this latter situation generally prevails when there are children, wives or dependents in the family available for this task. The remaining livestock owners either hire their herding done or leave their livestock with other livestock owners and pay a yearly fee, which may

¹Nine farmers of Magugu have already given as the reason why they have relocated their farms the fact that livestock was causing too much damage on their old farms. This reason for moving has only arisen in the past few years with the increase in livestock numbers.

be paid in the form of a goat or sheep, a sum of money or the milk of the animals.

Under the present herding system there is still much complaint about the damage livestock do to crops. Often the herd boy neglects his job and allows the livestock to wander into tsetse-infested or onto cultivated acres. Hence, the day is rapidly approaching when public opinion will force more rigid control over herding activities. However, as long as livestock remain the most popular method of bride purchase (and the only substitution at Magugu is the payment of a sum of money in lieu of cattle), the possession of livestock, and the tendency to increase herds for purposes of prestige, will remain a problem.

Sale of cattle and cattle products.--The sale of cattle has increased rapidly in the past few years. In 1951, only two head of cattle were sold from Magugu; in 1952, fourteen head were sold; and in 1953, twenty-two head. Therefore, the sale of cattle still plays a small role in producing cash income to the farmer, though it is increasing in importance from year to year. Cattle, goats, and sheep, however, are often traded for food, and it happens that grain farmers will acquire a nucleus for a herd by trading some of their produce for animals. In addition, livestock are a security for loans, or are sold with the understanding that the seller expects the buyer to keep

the animals a reasonable length of time until the seller has had a chance to buy them back.¹

Like cattle, milk and butter do not form an appreciable amount of the yearly cash income of the area. Two hundred sixty-eight shillings worth of milk and Shs. 875/- worth of butter were sold in 1953.² Goats valued at Shs. 837/- and sheep valued at Shs. 123/- were also sold. The largest item of income from livestock was Shs. 3,355/- obtained from the sale of cattle, but even this figure does not represent money received by the Magugu cattle raiser. Most of this sum represents income to local butchers who often buy their cattle outside the Magugu area at Government-sponsored auctions or from foreign owners more willing to sell than the local farmer.

Though livestock are not an important source of cash income at Magugu, they are nevertheless an important aid in keeping down regenerating bush (see Fig. 107). This is especially true of goats and sheep. Without the presence of these animals the slashing and trimming work, which even now is inadequately done, would probably get

¹Many farmers listed as "livestock owners" do not own the animals but care for them for others or own them only on a temporary basis as security for loans. Therefore, the more proper term would be "livestock possessors", but for this study any farmer who keeps livestock on a year round basis is listed as an owner.

²In 1954, the East African shilling was valued at fourteen American cents. Because the shilling's value is subject to change, the equivalent value in dollars and cents is not given.

entirely out of hand. In addition, because of the wide variety of soil types, many of which are not suitable for grain cultivation, livestock provide the only economic use for large areas of what would otherwise be classed as waste land.

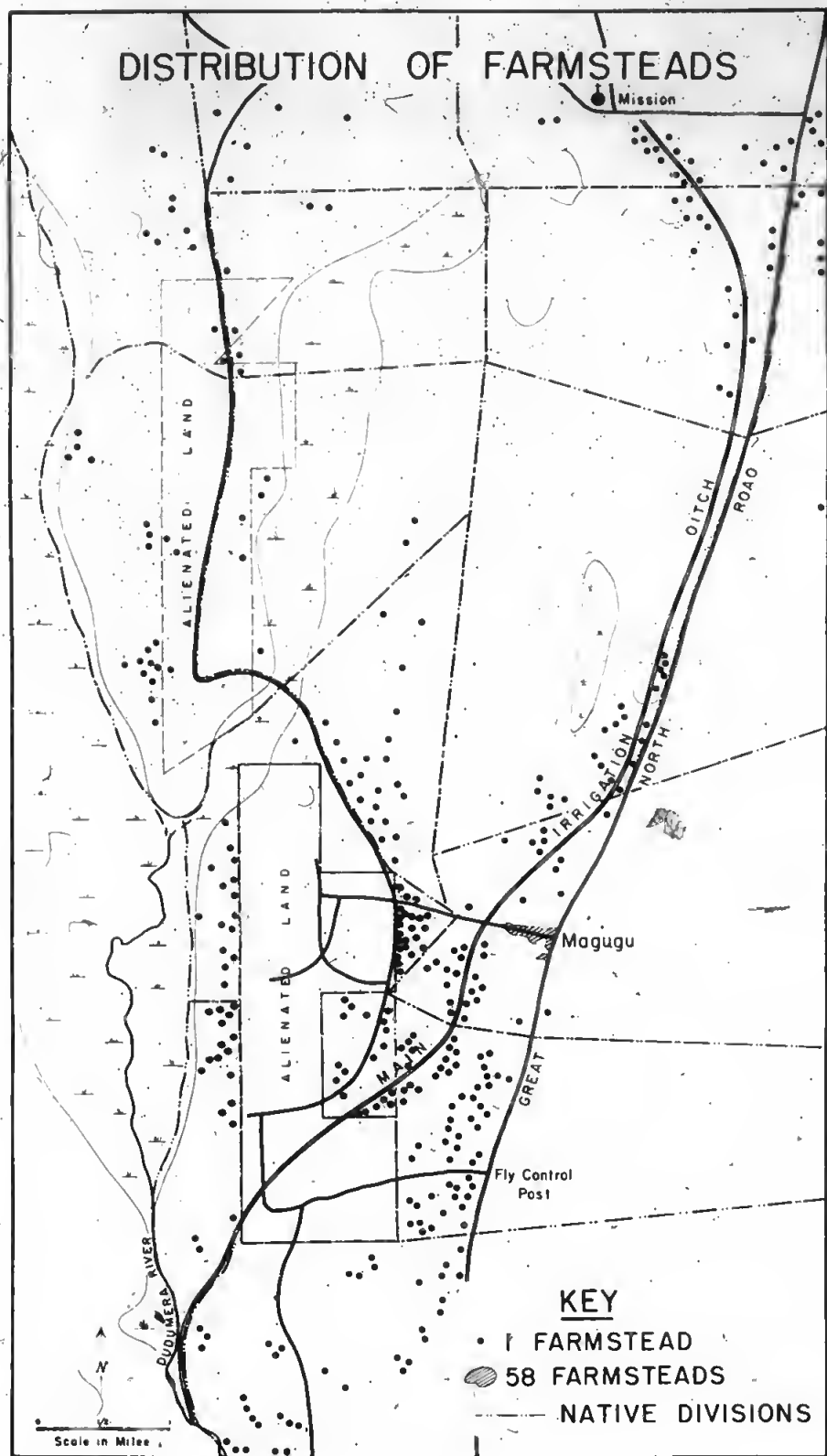
As Magugu is on the route of the great cattle drives to the northern market of Arusha, it is relatively easy to market the animals (see Figs. 35 and 36). These huge cattle drives, numbering in the hundreds, serve as an example of what other tribes are doing in culling operations and as an incentive for the Magugu cattle owner to do likewise. If wise livestock management can be taught the Magugu farmer, which must include yearly herd culls and some method of maintaining flesh during the dry season, livestock should become an increasingly important agricultural asset in this area.

LOCATION OF FARMS AND FARMSTEADS

Picking a farm.---In deciding where to locate a farm at Magugu the potential settler uses a wide variety of methods in picking his land (Fig. 109).¹ One hundred eighty-two farms, or nearly 37 per cent, were chosen because of "fertile soil". In addition, fifty-two farm sites

¹In Magugu, though, there are 395 farm operators, there are 489 farms, as some operators have two, three, and even four separate farms.

DISTRIBUTION OF FARMSTEADS



were chosen because the operator felt they would be good spots for a specific crop such as millet, rice, sugar cane, or corn. Although some of these fifty-two were also chosen because of availability of water (especially for rice and cane), soil characteristics were the main reason for locating these farms where they are. Hence, 234 farms, or nearly 48 per cent, were chosen for reasons of soil. Although the African cannot analyze the soil in the sense a European does, nevertheless he is canny in observing existing vegetation, slope and drainage, soil texture and color. A glance at the soils map on page 104 and the location of farmsteads map on page 174 shows a correlation between the better easily worked soils and the location of the farm sites.

Eighty-four farms (17 per cent) were chosen because some friend, fellow tribesman or relative lived nearby. Invariably these farms are also home sites and represent the first farm of a new settler. The concern, in the beginning, is that the farmer be with friends, a better insurance for him against want than even good soil would be. If the soil should prove bad, the farmer will search out a new plot to work but will continue to live on the original homestead. "Nearness" to something or another has influenced the choice of eighty-three other farm sites. Hence, 34 per cent of all farms in the Magugu area were chosen strictly for their local locational advantages. Of these latter eighty-three, thirty-nine

were picked because they were conveniently located near European estates where the African had worked in the past or was still working. Twelve farms were chosen because they were near the trading settlement with its greater social possibilities, and seven were chosen because they were near the headman.¹ Twenty farms were selected because they were near the irrigation ditch where the farmer could wield more influence in getting water onto his fields when needed.

A complicated variety of other reasons were given for the African's desire to be near something--ranging from a desire to be near the Great North Road to watch traffic to that of a woman who was the mistress of a local Greek farmer who demanded that she live conveniently near his farm headquarters. Others wished to be near the Mbugwe Mission or Kibaoni trading center because of illness that could be treated at the dispensaries at both these places; or wished to live near fellow Christians in order to resist better the aggressiveness of their Moslem neighbors.

Nineteen farm sites (4 per cent) were chosen because they offered good grazing land nearby, and conversely nine sites (2 per cent) were chosen for the protection

¹Other than being friends (socially or politically) of the headman, locating near his farm would probably insure the operators a better supply of water from the irrigation ditch. The headman sees to it that the water needs of his own farms and his friendly neighbors are taken care of first.

they offered against damage by livestock. These two categories have sprung up only in the past three years, a reflection upon the increased livestock holdings of the area.

Only sixteen sites (3 per cent) were purchased from other operators. Generally a purchase was made only because the previous operator was moving from the community or else wished to escape unfriendly neighbors. The price paid for such farms was generally low, often a farm with house selling from twenty to fifty shillings. Sometimes (but rarely) higher prices are paid for a farm if it is particularly attractive to the buyer because of a specific crop growing upon it. Hence, farms with good rice paddies or excellent plots of cassava will command prices up to two hundred shillings.

It is surprising that only sixteen (3 per cent) farmers claimed to be on the plots they were because "they had been given them when brought from Kiru". Though undoubtedly this would have represented the largest category of choice ten years ago, the passage of time has caused a reshifting of farmers to farms more to their liking than their original ones. This does not mean that only 3 per cent of the present farms belong to former Kiru evacuees. Rather it implies that the original Kiru evacuee, for many of the reasons previously given, has abandoned his original holding and now gives a different reason

for living where he does.

Fourteen farms (2.9 per cent) were chosen because they offered good home sites. Generally these farms contain a small patch of cultivated ground such as native beans, peas, or melons, whereas the main farming operation is more distant. This is especially true of rice and cane farmers who want a dry site for their homes removed from the irrigated fields.

Nine farmers (2 per cent) did not know why they were farming where they were, or if they knew could not express it in words. Of this group, one referred to "luck"; another that he was out for a long walk, liked the Magugu community and stayed; and a third that it was probably "God's will" that he was where he was.

The remaining 1 per cent of the farms at Magugu are farmed for a variety of reasons; one operator, miles from any other neighbor, gave as his reason for locating there that "he didn't like people and wanted to be alone"; another was a prostitute who was given her farm by one of her boy friends in return for her more obvious services plus a promise to become a Moslem; and two farmers merely settled where they did to "escape disease at Mbugwe", a particularly surprising reason when one considers the number of diseases that prevail at Magugu.

FARM AND FIELD SIZE, OWNERSHIP, AND INHERITANCE

Farm and field size.--With one or two rare exceptions, the only tool used by the Magugu farmer is the hoe. It is used for plowing, planting, cultivating, and even harvesting. With little capital to enable him to buy more advanced implements, the restrictions of hoe agriculture are reflected not only in the soils he is able to work, in the crops he plants, and in the yields he receives, but also in the size and fragmentation of his fields. The largest field at Magugu is eleven acres, planted to corn; it belongs to the headman, who has oxen and a plow and is able to conscript labor from the local jail to work his fields (Fig. 110). The smallest plots consist of just a few plants--perhaps of cassava, melons, fruit trees, or native beans (Fig. 111). The average size of cultivated fields is 0.71 acres, but the median size falls between one-twelfth and one-sixteenth acres.¹

The farm pattern at Magugu is one of great fragmentation and tiny size; of many fields interspersed with bush or abandoned fields; of oddly shaped fields and of no heavy concentration in one area of any one crop (Figs. 112 and 113). There is no place at Magugu where one may stand and see broad vistas of cultivated fields. Rather, one must search out the small farms, often alone in the bush with no near neighbors.

¹The median size is so small because 820 fields consist of tiny provision plots.



Fig. 110.--The Jumbe (headman) and son standing in a field of immature irrigated corn. This is the largest African field in Magugu.



Fig. 111.--A small field in a depression along the Dudumera River. In this one field corn, bananas, beans, and melons are raised.



Fig. 112.--The trading center with many small fields nearby. To the upper right of the trading center is the area shown enlarged in Fig. 113 (Photo courtesy of the Air Survey Division, Department of Lands and Surveys, Dar es Salaam, Tanganyika).

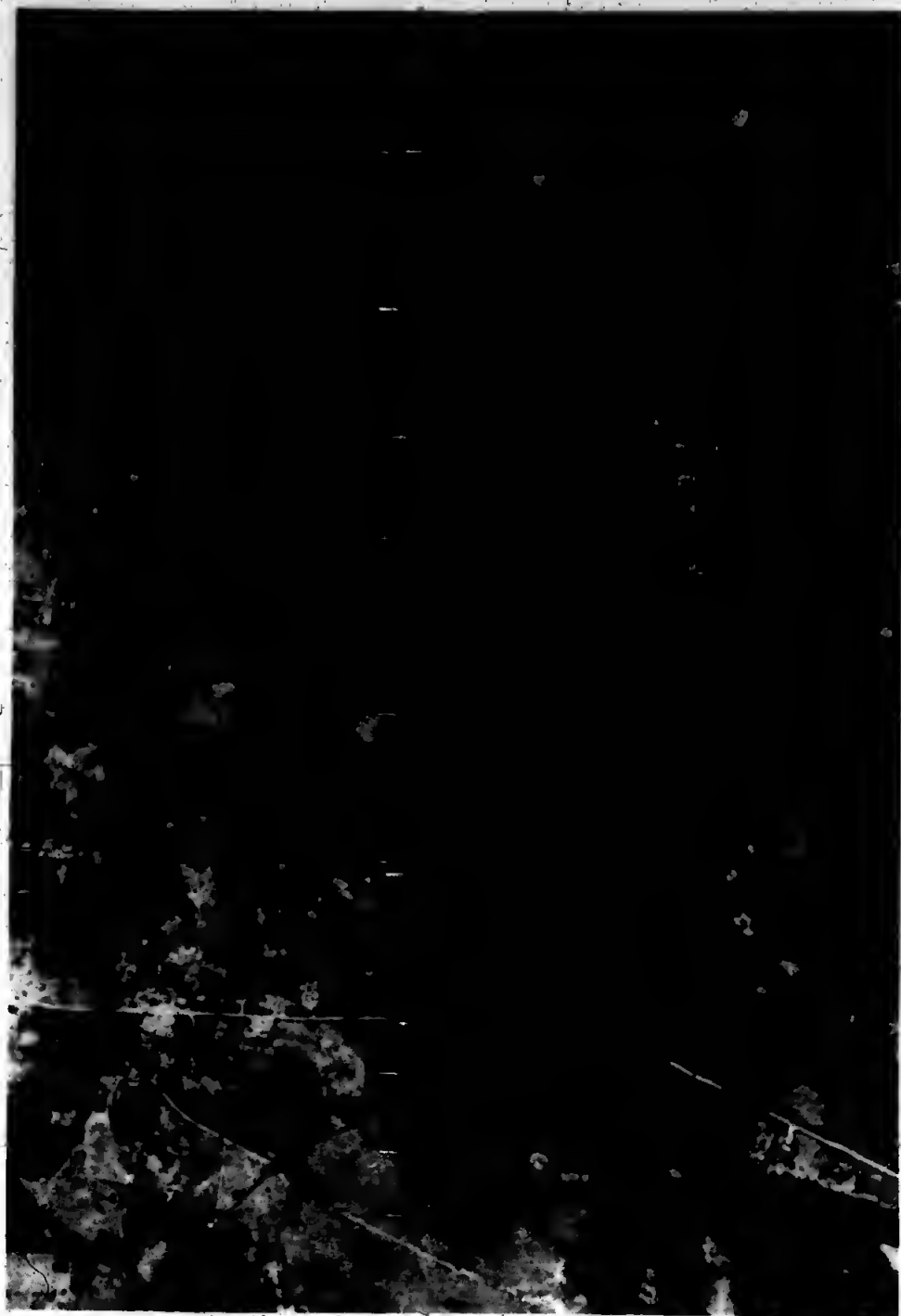


Fig. 113.--The predominant rice area. The dark lines are irrigation ditches, and the small dark patches are rice paddies. The large white line is the Magugu-Sino road (Photo courtesy Air Survey Division, Department of Lands and Surveys, Dar es Salaam, Tanganyika). Scale: 1:3,750.

There are 1,713 fields in the Magugu agricultural complex. As these fields represent 489 farms, there is an average of $3\frac{1}{2}$ cultivated fields per farm. As the average sized cultivated field is 0.71 acres, the average cultivated area per farm is 2.48 acres. This, of course, does not mean that the average sized cultivated holding is 2.48, because on the average a farmer possesses 1.2 farms. Therefore, the average cultivated holding of a Magugu African would be approximately 2.53 acres of land. Again this does not represent the total holdings of the farmer, because it does not take into consideration abandoned fields, grazing lands, and unused bush. These categories, abandoned fields, grazing and bush, are hard to determine in an area like Magugu. At the present time the farmer does not think, for example, of ownership of grazing lands, but rather thinks of them as community-owned in which he has certain rights. Adjacent bush land, however, is considered part of his holdings and is demarcated in the African's mind. A Magugu farmer will carefully point out his farm boundary through untouched bush as "in line with those two houses", or "from the end of my corn field to midway my neighbor's castor beans". This bush represents land which can be utilized when yields decrease or family size increases. However, if a new settler arrives, the headman and elders of the Native Authority may grant him such bush land if they feel the present occupant will not use it in the foreseeable future.

At present there is practically no fallow land in the area, but there are abandoned fields. This can be explained by the fact that many of the farmers have been here only a few years, and the fertility of their original holdings is still high. Abandoned fields represent an enterprise that has failed with no intentions to try again. Hence, these abandoned fields cannot be considered fallow land in the usual sense of the word, even though some of these plots may be used again by others. Repeated questioning regarding declining fertility and measures taken to prevent it brought forth only suggestions that fertility depended entirely upon rainfall or irrigation water. An additional reason for lack of fallow land is the availability of free land that has not been cultivated. Hence, though there are abandoned former fields, they do not, at present, represent true fallow land that is intended to be farmed at a later date. However, there are a few patches of true fallow land (but these are rare) that are being rested in anticipation of replanting to rice.

Ownership concepts.--The concept of land rights is poorly defined at Magugu. According to the Native Authority the boundary of an African farm is "as much as is cultivated". This conflicts with many farmers' ideas concerning ownership of untouched bush and will certainly be a cause for friction when the area becomes more heavily settled.

At the present time any African coming to Magugu need but ask for land, and if the local authorities feel he is capable of cultivating it, it will be given to him. However, many farmers who come here do not bother to ask the local authorities for land---they merely move onto an available empty plot. If no conflicting claims arise, they are allowed to remain. In making this survey some farmers were found, especially between the Magugu European estates and the Tindiga Swamp, who had farmed there for a number of years, had asked no one for permission to occupy the land, and were unknown to the local Native Authority.

Inheritance.--Although farm boundaries are poorly defined, conditions under which land is inherited have been regularized to a remarkable degree for such a young community. The following inheritance situations prevail at Magugu and in cases of dispute are enforced by the Native Authority:¹ (1) if a man dies leaving a wife or wives and children, the land is inherited by the wife or wives alone; (2) if a man dies leaving grown sons and no wife, the farm is inherited in equal shares by the sons (if necessary, it will be divided or sold to satisfy all the sons); (3) if a man dies leaving one or more grown sons and one or more grown daughters (and no wife),

¹The main informant for this information was the headman of the village. Discussions with some of the elders and farmers confirmed most of this information.

three-fourths of the property will be inherited by the son or sons and one-fourth by the daughter or daughters;

(4) if a bachelor dies, the land will go to the nearest known relative; if there are no known heirs, it is sold and the proceeds go to the Native Authority treasury. However, if the bachelor were a Moslem, the proceeds go to the local Moslem treasury, and if a Christian, to the nearby Catholic Mission;¹ (5) if a woman land owner dies leaving a husband and children, all proceeds go to the husband; (6) if a woman dies leaving only sons, or sons and daughters, the same procedure prevails as for a man in numbers two and three above; (7) if a woman dies leaving small children only, the farm is given to her brother or brothers who in turn support and raise her children. If there is no brother, neighbors (or even strangers) will "adopt" the children and may farm the land and use the proceeds until the children are grown, whereupon the farm will be given to the children; (8) if a single woman dies, the same procedure is followed as for a bachelor in number four above.²

¹As previously mentioned, this is mainly theoretical. Upon the death of such a bachelor, the proceeds will generally be pocketed by the headman and his elders; or at best it will go to the Moslem treasury even if he were a Christian.

²The situation of a man dying and leaving only small children does not seem to be considered. Presumably if his wife has died he will have remarried or else the small children will be adopted by relatives. The eight inheritance situations listed above do not embrace all the situations that might arise, but they give types of inheritance laws that are being developed.

It should be pointed out that in Magugu the role of inheritance in the fragmentation (or lack of it) of land has been a negligible one. As so many settlers are new arrivals, there have been few such transactions, and the passage of time alone will make the impact of inheritance regulations felt upon the land use pattern.

CROP ACREAGES

A wide variety of crops is grown at Magugu. Some of these crops reflect the environment from which the farmer originated. Others reflect the new conditions that were met by the settler when he came to Magugu. Because of the shortage of water most crops are not irrigated, and these dry-farmed crops generally include millet, corn, castor beans, cassava, peanuts, fruit, and such miscellaneous crops as sunflowers, beans, and melons. Other crops require irrigation, and among these are rice, sweet potatoes, onions, sugar cane, and certain varieties of garden vegetables.

Generally all the Magugu farms would be called mixed subsistence farms. Most of these farms contain a wide variety of crops. Yet in certain areas of Magugu one crop is concentrated more heavily than in other areas. Hence, most of the millet is grown near the Great North Road where no water is available for irrigation; and most of the rice is raised adjacent to the irrigation ditches.

Most of the corn is scattered between and among these two areas (Fig. 114).

Millet.--The largest number of cultivated acres at Magugu is devoted to millet. Four hundred fifteen acres are planted to this crop. Unlike all the other crops raised, none of it is irrigated (Fig. 115). The varieties of millet grown range from the tall goose-necked variety to the short small-grained variety (see Fig. 117). The large plantings of millet reflect the influx of Wambugwe tribesmen, because the Wambugwe have been millet raisers for many years.

Matufa, with its heavy concentration of Wambugwe, is the area of greatest millet acreage. Much of this millet is now being raised to the east of the Great North Road by operators living to the west of the road. This is a new development that has taken place because of large cattle herds being kept to the west of the road in Matufa and because of increasing population pressure in Matufa. Though the area to the east of the road is available for cultivation, as yet only one dwelling has been erected on the east side of the road. This home has been constructed in contravention to the original plans made to keep this area free of all permanent dwellings in order that no structure would be built near the uncleared bush which is not far to the east of the road.

Millet has the advantage of being drought resistant,

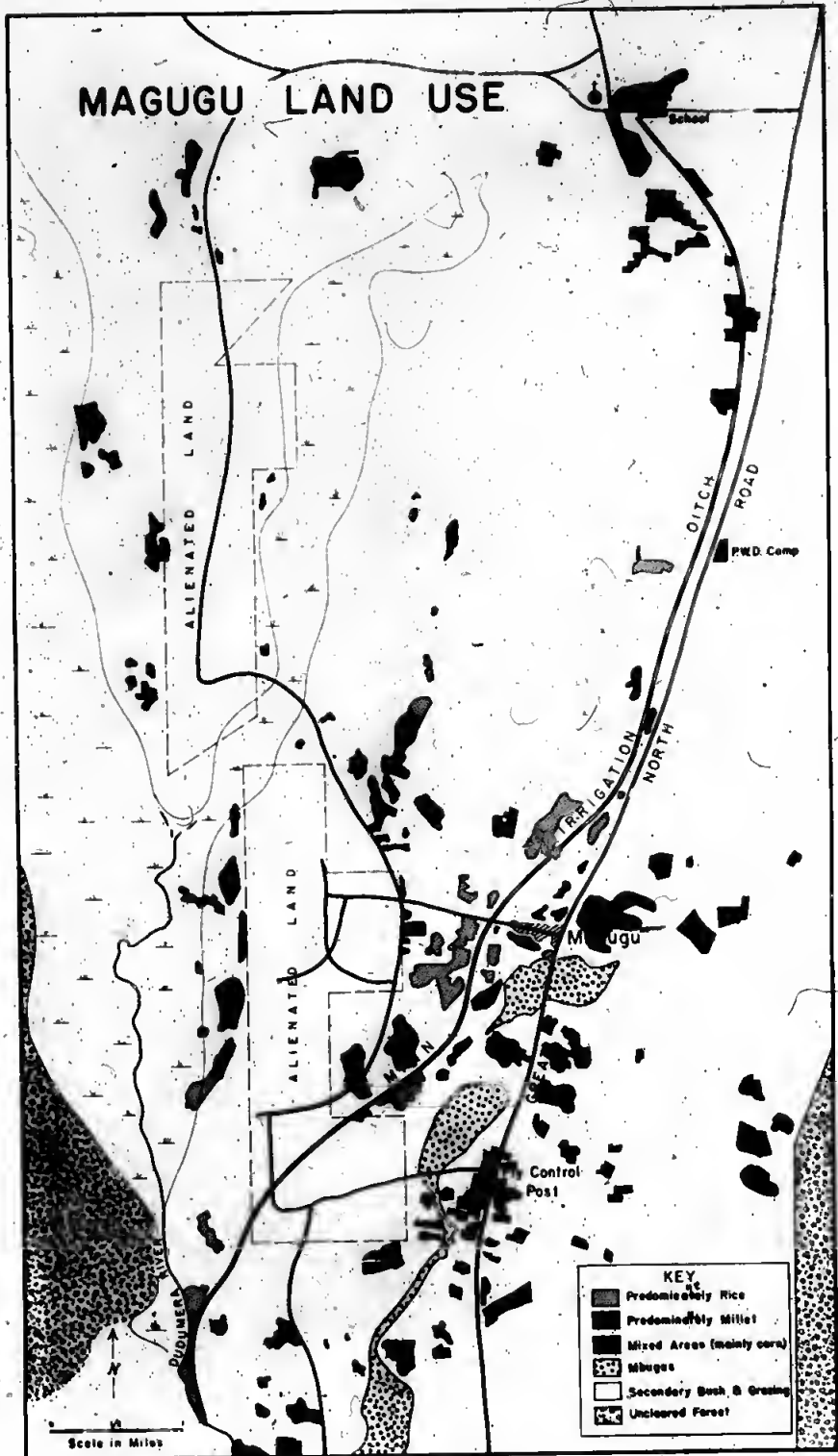


Fig. 114

NON-IRRIGATED
CORN, MILLET FARM
MAGUGU KALIMAJI

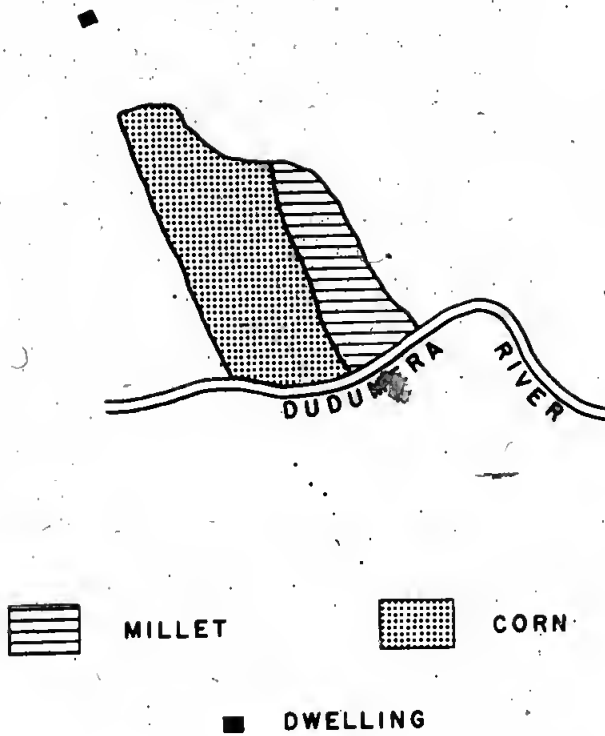


Fig. 115

a necessity where irrigation water is not available. Even so, the partial failure of the summer rains in 1954 came perilously close to ruining the millet crop, and yields were generally low.

The Magugu farmer has two main uses for millet. It is ground into a flour and used as a food much like ground corn, but probably more important is its utilization in the manufacture of pombe, an African beer.¹ Up to the present time there has not been enough millet raised in this area to supply the demands of the brewers, and millet is still imported from surrounding areas.² Not only does the sale of pombe bring in a handsome profit to the brewers, but also each time a batch is made a license fee of ten shillings is paid to the Native Treasury, an appreciable yearly source of income to the local authorities.

Generally millet is raised on the sandy well drained soils of the area. If the fields are tilled by an Mbugwe, they will be planted in straight rows with a distance of about thirty inches between the rows. However, non-Mbugwe fields commonly have no pattern of planting at all.

¹ Pombe has a taste much like a mixture of beer and buttermilk and is reputedly good for stomach ulcers and upset stomachs.

² However, small millet (mbage) is sometimes sold at the Magugu auction and exported. In 1953, for example, 153½ kilos were sold for Shs. 109/50.

There are 254 individual fields of millet with an average size of 1.63 acres. Hence, the average size of a millet field exceeds that of any other crop planted at Magugu. This tendency to large size for Magugu, can be explained by the profitable nature of this crop, the availability of ample areas of suitable millet soils, and the low yields produced by this crop in comparison with other crops. As long as the area of irrigable land remains limited and the demand for this crop remains high, it can be presumed that the acreages of millet will not only remain high but will also increase. This will certainly be the case if additional Wambugwe immigrants move into the area.

Corn.--The crop commanding the second largest acreage at Magugu is corn.¹ There are 345 acres planted to this crop, only a small percentage of which is irrigated (Figs. 115 and 116).

Corn is raised as a human food crop, none of it being fed to animals. Some of it is eaten before it matures, and a favorite delicacy is an unripe corn ear heated (and generally burned) on a stick over an open fire. Most of the crop, however, is allowed to mature and dry, whereupon it is picked, shelled, and stored in baskets within the house or a small shed near the house.

¹Because Magugu is in a British territory, corn is known as maize. In Swahili it is called mahindi.

PARTIALLY IRRIGATED FARM KIBAONI

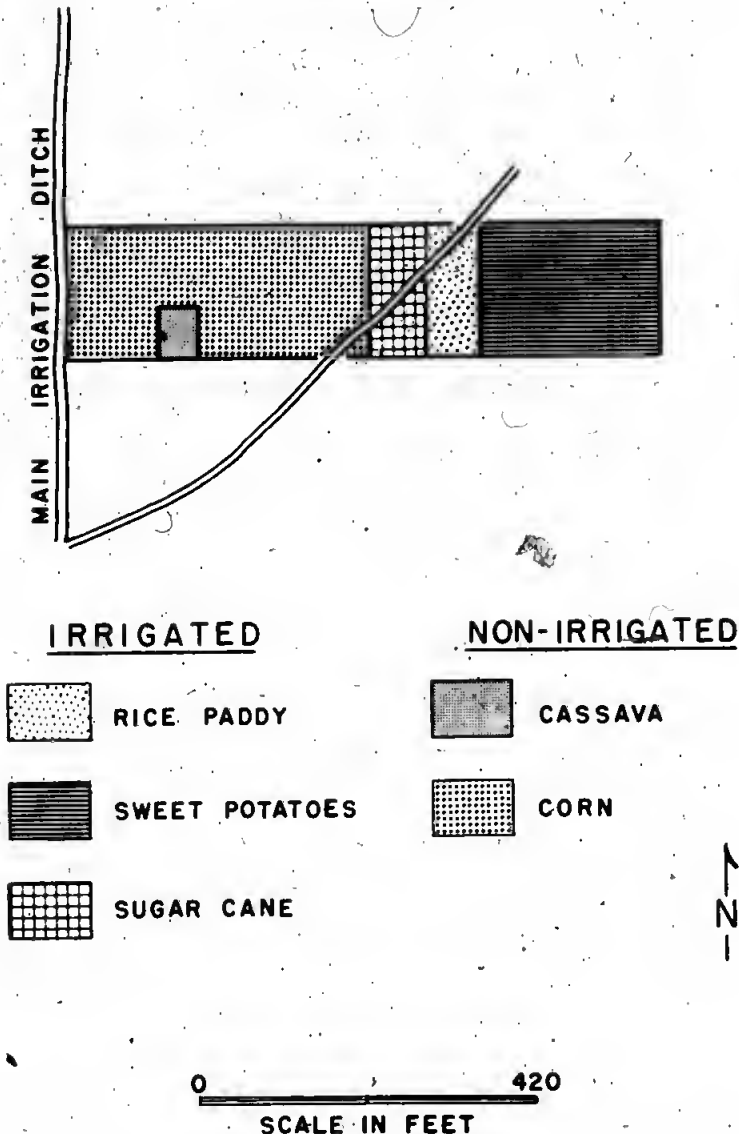


Fig. 116

It is ground into a flour as needed and forms an important part of the diet of the people. There is no surplus for export, and during the past two years none has been offered for sale at the local auction held in the trading settlement. Rather, the African will often purchase some of his requirements from the European farmers living on the nearby Magugu estates. A grinding mill for corn is maintained by one of the local Asian traders, but most of the grinding at the mill is done for European farmers who use the ground meal (called posho) as the main item in the diet of their laborers (see Fig. 23).

There are 325 individual fields of corn at Magugu, the largest number of fields devoted to one crop. However, as the fields average 1.06 acres, or nearly one-half acre per field smaller than millet, the total acreage in corn is smaller than that of millet.

The yields of corn vary greatly. Irrigated corn produces high yields; some of the better fields yield sixty to seventy bushels per acre (see Fig. 110).¹ In general, however, the corn fields are poorly prepared, the corn is unevenly planted, carelessly tended, and the yields are low. In certain non-irrigated fields, abandoned entirely in 1954 when the rains fell at the wrong time,

¹Irrigated corn can be grown twice a year with plantings in January-February and April-May. However, because of water shortages, this is seldom done.

the combination of neglect and drought killed every plant. The typical non-irrigated field in 1954 yielded less than ten bushels an acre.

Corn is sometimes planted with some other crop or crops. Hence, it is not unusual to find castor beans, cassava and corn in one field (Fig. 118). As a result, something is generally harvested, for cassava and castor beans have even greater resistance to drought than millet, and they will produce a crop when the corn fails entirely. With the erratic rainfall regime that prevails, a good corn crop is harvested only about 50 per cent of the time.

Continual attempts are being made to expand the acreage of corn, but as these attempts are commonly made upon the poorer soils and non-irrigated areas, such efforts are not generally successful. The only permanent solution to the corn problem would be the availability of more water for irrigation. However, more water for irrigation of corn cannot be had at present because of the heavy demands made upon the water resources of the area by the rice growers.¹

¹Mr. R.W. Collett, Agricultural Officer at Mbulu, in a letter dated Sept. 26, 1944, to the Senior Agricultural Officer at Moshi, Tanganyika, speaks of the "clock-work regularity" with which corn could be turned out at Magugu under irrigation. Instances are given of European farmers who had to replant their corn crops three times because of such setbacks as locusts or army worms. Nevertheless, they finally harvested good crops by resorting to irrigation during the dry season. In 1954, Mr. Geo. Combos of Magugu replanted his corn three times due to army worms and eventually reaped a bumper crop.



Fig. 117.--Goose-necked millet.
This variety often grows over ten feet
tall.

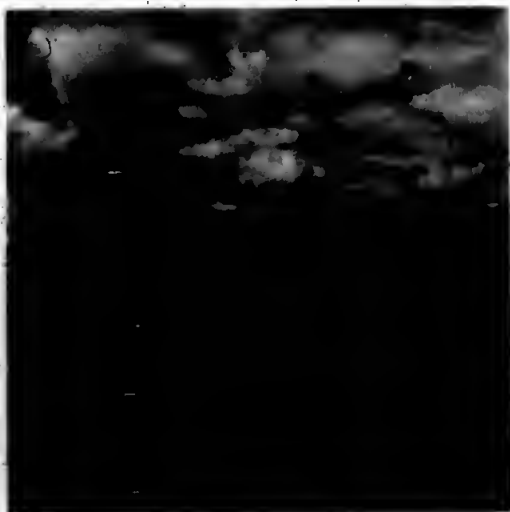


Fig. 118.--Castor beans, cassava,
and corn in one field.

Rice.---Rice was introduced to Magugu nearly ten years ago when a small sample of rice that had been raised along the east coast was tried out. From this beginning the cultivation of rice has slowly expanded until in 1954 there were 241 acres in 177 different fields (Fig. 119). The original seed proved to be such a good variety that it still is raised extensively at Magugu. The Government has now established a rice experimental plot at Magugu to test other varieties.¹ It is hoped that some of these new strains will increase the current yields of rice, and many of the more promising varieties are being tested during the 1955 growing season.

Although rice ranks only third in acreage of crops planted at Magugu, it ranks second both in size of fields and in yearly cash crop income. The average field of rice contains 1.36 acres, and all of it is paddy rice (Fig. 120). Though rice requires more man-hours per acre than any other crop grown at Magugu, the fields are relatively large because of the great amount of labor required to get land ready for rice whether or not a large or small piece is involved (Fig. 121). Hence, the mechanics needed to bring water to a field are little greater for a large piece than for a small one. Similarly, the protective dikes needed to hold the water on the land can be extended to encompass

¹These plots were planted in 1954 under the supervision of Mr. Roger Austin, resettlement officer located at Babati, Tanganyika.

RICE, CORN, SWEET POTATO FARM MBUYUNI

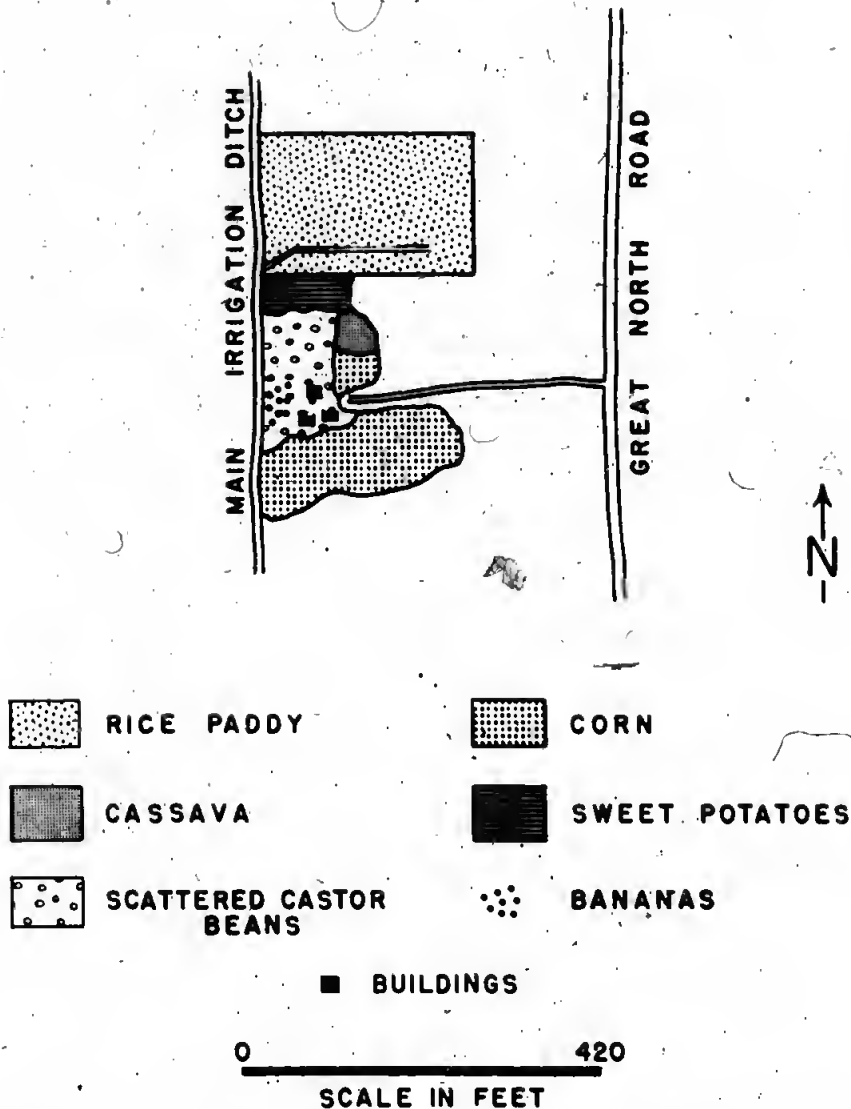


Fig. 119

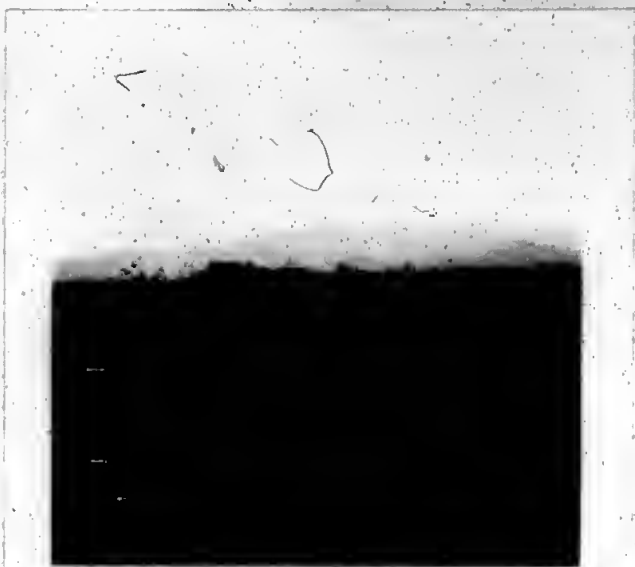


Fig. 120.--An excellent field of paddy rice. In the background is un-cultivated bush.



Fig. 121.--One of the largest fields of rice at Magugu. The grass hut is a temporary one used by the man while protecting the rice from birds.

a single large field with much less effort than would be necessary to encompass two small fields.

Conditions for raising rice are particularly ideal at Magugu. The alluvial soils upon which it is grown are productive. Slope is gentle but sufficient to allow a flow of water through the paddies. In addition, an impermeable hardpan within eighteen to thirty-six inches of the surface holds the water on the land and at the same time prevents salts from being brought up from the sub-surface.¹ Temperatures are sufficiently high for this subtropical plant and with the cessation of the rains in June a dry season permits harvesting.

The African encounters several difficulties in raising rice. Rice culture requires a great amount of labor. Seedlings must be raised during October and November. At the same time the paddies must be plowed and flooded for the new plantings to be made in December and January. Sometime during the year irrigation ditches must be cleaned and repaired. Once rice is planted it needs daily watching and frequent watering and weeding. When rice begins to form grains, it needs constant guarding from sunrise to sunset against the maraudings of birds and animals. (Fig. 122).² When the crop is ripe, it must

¹See Chapter II for the discussion of soils and hardpan.

²The Sudan Dicoch is the worst offender. This bird nests near Magugu. At certain seasons these birds descend by the millions not only upon the rice crop but also upon the millet and corn crops as well.

be harvested by hand, cleaned by hand, and shelled by hand (Fig. 123). As a result of all the labor involved, it is not uncommon for an African (1) to plant rice seed-beds but never transfer the plants to the paddies or (2) once the paddies are planted to abandon the paddy and never care for the crop or harvest it.

Rice is also an unhealthy crop to grow. The paddies constitute great breeding grounds for mosquitoes which in turn spread malaria. The water, in which the farmer must work, is heavily infected with bilharzia, a parasite causing one of the great debilitating diseases of East Africa. Ill-managed irrigation permits various fungi to flourish. In addition, slugs, snails, and leeches, which proliferate in the rice waters, may not only attack crops but are also carriers of human disease as well.

Despite the drawbacks to rice culture, rice is one of the most popular food crops raised at Magugu. The yields per acre are high, the price of that sold for export is generally high, and it is prized in the diet of the farmer.¹ Only the lack of sufficient water hinders the expansion of rice growing by those willing to do the work on this crop.

¹Excess rice is generally auctioned at the Magugu market in June, July, and August, with 96 per cent sold during the month of July. The price is Government controlled and fluctuates very little during the year. It is sold both hulled (mchele) and unhulled (mpunga). In 1953, Shs. 9,653/- worth of rice was sold at an average price of Shs. 0/55 per kilo.



Fig. 122.--A woman sitting on the roof of her house guarding her rice paddy which appears in the immediate foreground. She jerks the rope which is attached to tin cans in order to frighten birds. For comfort she has a white umbrella, barely visible, over her head.



Fig. 123.--A woman threshing rice by hand. The mat and basket are made in Magugu.

Castor beans.--Castor beans are the great cash crop for the Magugu farmer. Next to corn, there are more fields (302) devoted to this crop than to any other crop. Fields, however, are generally small, and castor beans are planted on only eighty-nine acres of land with the average field being 0.3 acres in size. It is the only crop grown at Magugu that is not at least partially consumed by the local farmer. In general its growth is discouraged by the Government, for it is extremely hard on the soils, and its spread is hard to control.

For ease of cultivation there is no other crop like it in this area. It will re-seed itself, needs little hoeing or care, resists drought when nearly everything else has failed, does not attract bird or animal pests, and can be harvested over a long period of time (or if one waits long enough the seeds will fall on the ground by themselves).

In 1953, as in most years, castor beans were purchased at the Magugu auction during every month of the year, and a total of Shs. 34,435/- was paid for this crop. Unlike rice, the price of castor beans is subject to great fluctuation, and a drastic fall in price at the end of 1953 caused only a trickle of beans to be harvested. The result was that during the first five months of 1954 only Shs. 3,741/- were paid for castor beans as against Shs. 15,461/- during a like period in 1953. This does not

mean that most of the beans were wasted at the beginning of 1954. Rather, because of the nature of this hardy crop, they were still waiting to be harvested, or, if already harvested, were being dried and stored waiting for a price rise.

The castor bean, which is the most ubiquitous of all the Magugu crops, seems to adapt itself to any soil type.¹ It has the further advantage of having barbs that protect it from most wild game, and as the kernels are enclosed in such a hard shell which is somewhat impervious to rain, they do not readily rot. If the prices paid for castor beans are sufficient to cover the labor in picking and drying, the main labor involved with this crop, then the acreages devoted to it will undoubtedly be expanded.

Cassava.--Cassava is the Magugu farmer's answer to drought and the locust. When corn and rice, and even millet, fail, cassava will usually yield some kind of return. Furthermore, since it is a root crop, the locusts cannot reach it.² Cassava is strictly a food crop, and though some of it is traded for other food, none of it appears on the market for export. Only thirty-eight acres are devoted

¹It grows on rice paddy dikes, on top of sand hills, and in the middle of uncleared bush that has never been farmed.

²Magugu is not bothered much by locusts, as they generally remain above the Rift Wall. It is well known the amount of damage they can do, and utter desolation remains after their visit. Fortunately for the cassava raiser, the locust has not yet learned to dig.

to cassava, but this acreage embraces 130 fields and patches, so that about one-third of all the farmers raise cassava (Figs. 124 and 125). Most of the fields are small, the average size being only 0.29 acres.

As cassava is a root crop containing much moisture and taking quite a bit of storage space, it is not easily stored, nor does it keep for any length of time unless it has been thoroughly dried (Fig. 126). It is commonly dug up as needed, dried, and pulverized into flour. Though it is easy to raise and requires little labor, it is subject to a number of blights and diseases. Numerous attempts have been made to convince the farmer that diseased plants should be destroyed and replaced with healthy stock, but this has met with small success. As a result, shoots from diseased plants are used as seed stock, and most of Magugu's cassava is subject to a blight which appreciably lowers the yield.

A few fields are irrigated with good results, but the greatest percentage of the crop is dry-farmed. There has been little increase in its cultivation during the past few years, even though the Government has been encouraging its growth as an anti-famine and anti-drought measure.

Sweet potatoes.--Although sweet potatoes occupy only twenty-six acres of land at Magugu, the high yields obtained make sweet potatoes a more important item in the

ONION, CORN, RICE, CASSAVA FARM KIBAONI

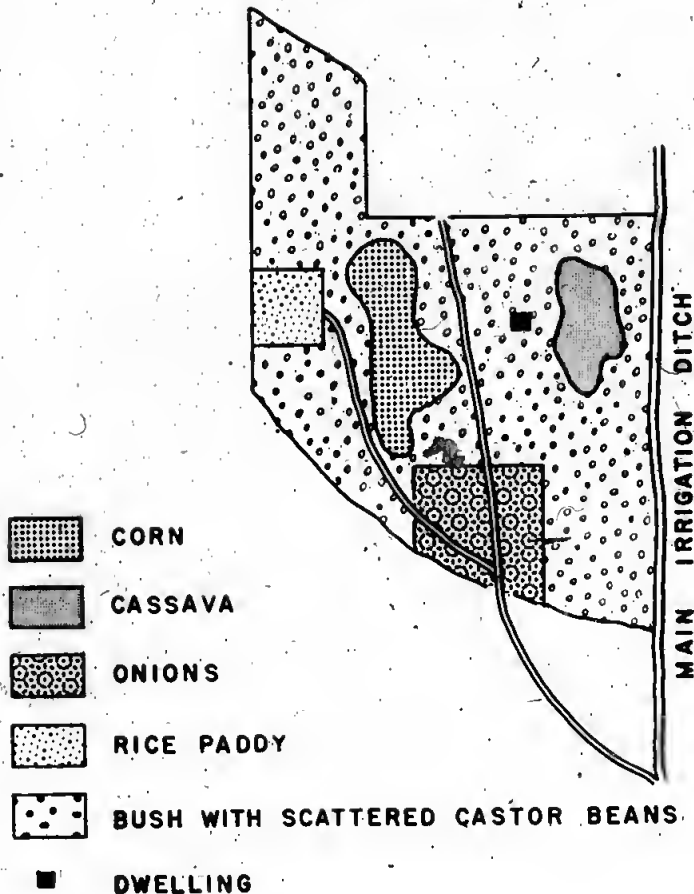


Fig. 124



Fig. 125.--A field of excellent cassava.



Fig. 126.--An uprooted cassava. On the sill and ground to the left are some cassava roots which are about to be ground into flour in the large wooden bowl.

diet of the farmer than is cassava. There are 114 fields of sweet potatoes, the average size of a field being 0.23 acres (Fig. 127). Most of the fields are irrigated and carefully tended. Sweet potatoes are planted on some of the best soils, a reflection of the African's liking for this vegetable.

Unlike American sweet potatoes, the variety raised at Magugu is nearly pure white in color. It grows to a large size, and because of this size and the necessity to keep the plant well-drained it is always raised on artificially made ridges (Fig. 128). The crop is often planted in fields adjoining rice paddies to permit easy irrigation. When sweet potatoes are dry-farmed, they, like corn, are commonly planted on top of a levelled-out ant hill which is particularly fertile soil (Fig. 129). These fields, however, have the disadvantage of drying out rapidly, and generally such attempts fail (Fig. 130).

Because of the poor keeping qualities of sweet potatoes, planting is spaced over a relatively long period of time. Generally a small field will contain mature plants, those partially matured, and new seedlings just started.¹ Sweet potatoes are harvested only as needed and are prepared for eating by slicing and frying them. Because

¹Sweet potatoes are propagated by planting a section of the vine. As a brilliant sun will sometimes kill the new vine, it is planted during a cloudy period or just before sundown.

DRY AND IRRIGATED FARMS (SAME OPERATOR) MATUFA

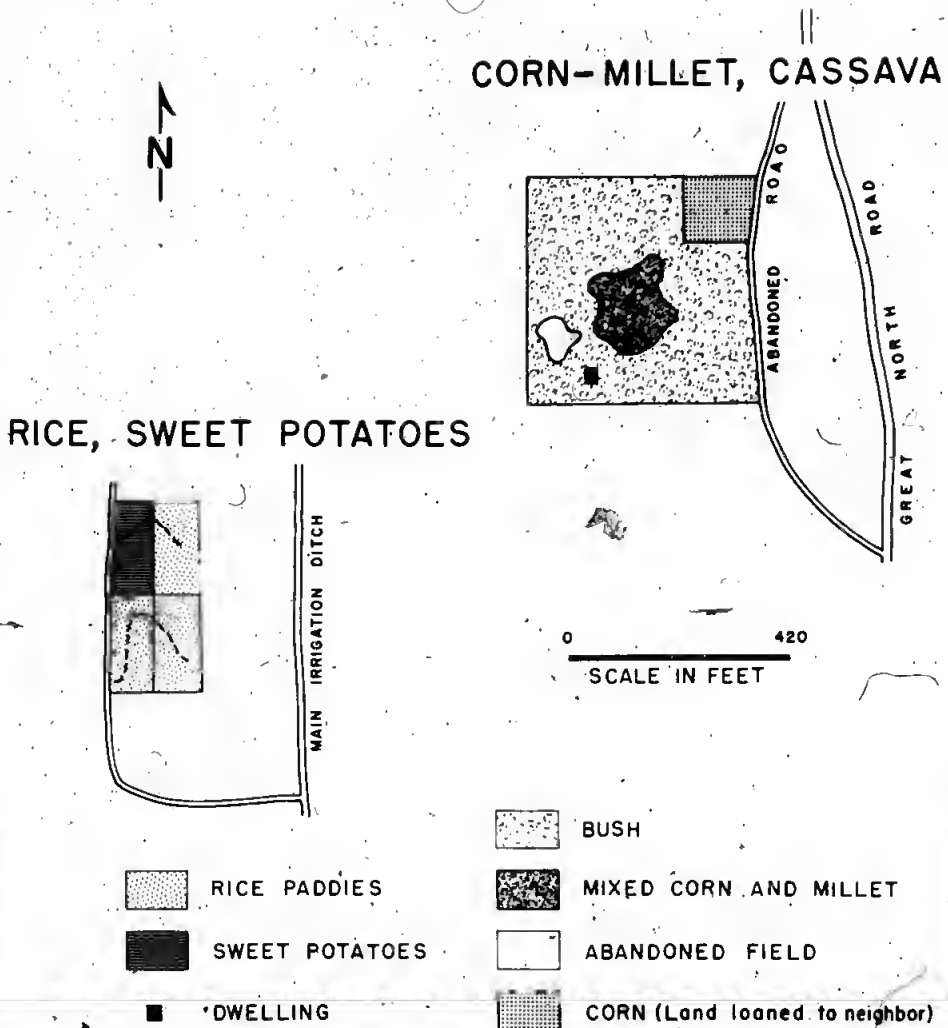


Fig. 127



Fig. 128.--Ridges constructed for the planting of sweet potatoes.



Fig. 129.--An ant hill that has been levelled for agriculture. Often these ant hills are planted to sweet potatoes or corn.

of the popularity of this crop and the variety it offers from the usual rice-corn-millet diet, sweet potato production will most likely increase in proportion to increased population.

Peanuts.--Peanuts are raised mainly for local consumption though a small quantity is exported to other parts of Tanganyika.¹ There are seventy-nine fields of peanuts representing 17½ acres, with an average size of 0.22 acres per field. Peanuts are eaten both raw and roasted and appear in the diet more as a delicacy than a staple, although some are pressed into oil for cooking purposes.

Peanuts are never irrigated and are generally planted on sandy soils where they flourish, as they are able to resist drought (Fig. 131). Watermelons are sometimes planted alongside, or intermingled with, peanuts, as both require about the same type of soils, and both are speciality crops.

The growth of peanuts is being actively encouraged by agricultural officers because of their soil-building qualities, but until better prices and marketing facilities are set up, they will probably remain a minor crop at Magugu.

Sugar cane.--Of all the crops raised at Magugu,

¹Peanuts are called groundnuts by the British and karanga by the African.

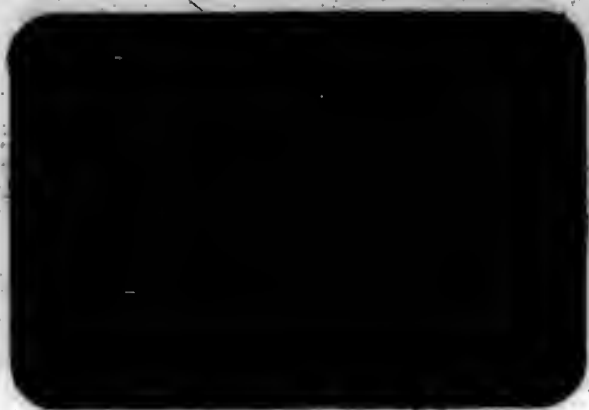


Fig. 130.--A remnant of an ant hill. Most of the hill has been levelled for agriculture. The stalks of the former corn crop are still visible.



Fig. 131.--A field of peanuts. In the background is uncultivated bush.

sugar cane appears to be the one that could be most profitably expanded in acreage. At the present time there are only fifteen acres under cultivation. There are sixty-two fields of sugar cane with an average size of 0.24 acres (see Fig. 116). No sugar cane is exported, and little sugar is extracted locally from the cane for home use. Nearly all the crop is cut and eaten in the stalk form, and the stalks are a favorite sweet of the children as well as of the adults. Some is brought to the tea stalls on the Great North Road and sold to travelers, and some reaches the small African shops at Makuyuni, where it is sold for the same purposes.

Although small patches of sugar cane are irrigated along the main irrigation ditch, most of the fields are on the eastern edges of the Tindiga Swamp (Fig. 132). Here there is plenty of water from small private irrigation ditches and plenty of fertile alluvial soils---two requisites for the raising of sugar cane. As most varieties of cane need twelve to twenty-four months to ripen, the frost free conditions found at Magugu fulfill the temperature requirements for this crop. In addition, the dry season at Magugu provides an ideal ripening period which gives Magugu cane a high sugar content.

With proper irrigation and drainage works, large sections of the Tindiga Swamp would make ideal sugar cane land and would provide a means of utilizing the large



Fig. 132.--Sugar cane. A banana tree in the foreground frames a small plot of sugar cane. This field is located near the main irrigation ditch in Kibaoni. Most sugar cane, however, is raised near the Tindiga Swamp.

quantities of water that now flow into the swamp and are evaporated. At the present time some of the European estates (in particular Sino Estate which is no longer cultivated because of its high water table) are seriously considering the raising of cane, and if such a movement materializes, it should encourage the Africans to increase their acreages of this crop. Of course, the problems of transportation and refining machinery will have to be overcome before any large scale operations could take place. One Government agricultural plan envisages the growing of cane by Europeans all the way from Magugu to Mto Wa Mbu, utilizing the ample water resources that flow out of the western Rift Wall (see Fig. 1). If this should come to pass, it is possible that cane will become the leading crop of the Magugu area.

Fruit.--Although there are no fruit orchards of any size at Magugu, there are nevertheless $13\frac{1}{2}$ acres devoted to a wide variety of fruits. This acreage is divided into 142 patches with an average size of 0.09 acres. Most of these plantings are bananas that are irrigated. They are found mainly along the main irrigation ditch or bordering the Dudumera River and Tindiga Swamp, where small irrigation ditches or river flooding are used. These bananas range in variety from small fingerlings to extremely large ones. By the Africans they are eaten raw, fried, or as the main ingredient in various types of puddings or sauces.

Other fruits raised are paw paws, oranges, lemons, limes, grapefruit, mulberries, mangoes, and breadfruit. Generally these trees occur in small bunches of a half dozen or less trees. A small amount of the fruit is sold along the Great North Road to travelers, but most of it is consumed locally. In general the quality of the citrus fruits (other than limes) is low. Oranges are extremely bitter, and grapefruit and lemons are both bitter and full of seeds. Mangoes, paw paws, limes, breadfruit and mulberries do well and are of good quality. Agricultural officers feel that nearly all these fruits could be raised commercially at Magugu if the proper varieties were introduced, and if proper methods of propagation were employed. If the acreage and yield of fruits could be increased considerably, the African's diet, which at the present is woefully lacking in variety, would be improved greatly. However, the huge profits made in raising paw paws by nearby Europeans has not tended to encourage the raising of this crop by the Africans, and it is doubtful that the acreage devoted to fruits will increase in the near future.

Miscellaneous crops.--Several other crops are raised at Magugu, but no one crop is grown on more than five acres. There are twenty-one acres devoted to miscellaneous crops, the average field size being 0.17 acres. These crops, raised in 128 different fields, range from commercial crops such as sunflowers and onions to food crops such as beans and peas. Four and three-fourths

acres are devoted to onions which are irrigated and which are increasing in popularity because of the high returns they bring (see Fig. 124). Four and three-fourths acres are planted to native beans, nearly all of which are consumed locally. There are also many small patches of native peas, melons, tomatoes, potatoes, carrots, egg plant, peppers, and other garden vegetables. Every year small amounts of onions, potatoes, beans, sunflower seeds, and peppers are auctioned at the Magugu market, but their total yearly output is so small that their impact upon the cash economy of the community is negligible.

WILD GAME DAMAGE

Nearly every farmer at Magugu is bothered by animals or birds attacking his crops. Although the damage done by such large beasts as elephant, rhinoceros, and buffalo is often spectacular, the greatest damage results from huge flocks of birds that regularly feed in the rice and millet fields (see p. 200, footnote 2). Merely protecting crops from these depredations requires a great amount of labor (Figs. 133 and 134). During the rice ripening season a steady din can be heard from the rice watchers who are beating pots and pans, throwing rocks, and yelling at birds (see Fig. 122).

The nocturnal maraudings of animals are not guarded against as carefully as daytime incursions. Here again, the greatest total amount of damage done yearly is caused



Fig. 133.--A buffalo killed at Magugu. When buffaloes of this size wander onto a Magugu farm, great damage ensues.



Fig. 134.--A single elephant west of the Tindiga Swamp. Because of the lush grazing in this uninhabited area, elephants seldom invade the Magugu cultivated areas.

not by large animals but by such small species as dik dika, wild pigs, porcupines, monkeys, and baboons. Although farmers along the banks of the Dudumera River and Tindiga Swamp are bothered occasionally by hippopotami, they regard the hippopotamus with affection, referring to them as gentle watotos (children). Invasions by such animals as rhinoceros, elephant, and buffalo are controlled by game scouts, who are authorized, within certain limits, to kill them.

THE MAGUGU MARKET

The auction.---The Magugu auction or market, under Government supervision, handles nearly the entire surplus of agricultural products from the Magugu area (as well as products from neighboring communities) that is sold through legitimate channels. The auction operates at least once each month of the year, and during certain periods is held semi-weekly or even weekly, usually on a Saturday. As the buyers are restricted to those with official Government buyer's permits, only three or four Asian traders from Magugu buy all the produce, because no one else possesses a permit.

The market, or auction, does not function for each individual transaction, but rather each morning of the auction the buyers bid against each other for the privilege of buying everything offered that day. Hence, if the main

item to be purchased for the day is castor beans, the highest bidder for castor beans will then purchase any other produce offered for sale.

Certain prices, notably that of rice, are Government controlled and fluctuate little throughout the year. Other items, such as castor beans, fluctuate greatly from week to week.

The seller is taxed a fee of $2\frac{1}{2}$ per cent of the price paid for the goods sold. This fee covers the charges of the auction, and this fee goes to the Native Treasury, which is responsible for the upkeep of the building, collecting the fees, and providing a market clerk.

Items traded.--Since its inception ten years ago, the auction has grown steadily until in 1953 this market handled transactions totaling Shs. 44,960/- (Table XII).

TABLE XII

MAGUGU AUCTION TRANSACTIONS, 1953

Product	Shillings
Castor beans	34,435/-
Unhulled rice	9,632
Onions	219
Sunflower seeds	156
Choroko beans	132
Small millet (<u>mbege</u>)	110
Red beans	88
Peanuts	63
Beeswax	35
Native beans	25
Hulled rice	22
Peppers	15
Honey (wild)	10
Potatoes	9
Tobacco	5
Lemon (wild)	4/-

These market figures do not represent the products sold only by the 395 farmers represented in this study. Some of it represents products brought to the auction by African farmers from Dudumera, Mbugwe, and as far away as Babati. Occasionally even an Iraqw tribesman from above the Rift Wall will carry his produce down to the Magugu market. In turn, not all Magugu farmers sell all their produce in Magugu. Like sellers anywhere in the world they search for the best price and may walk to Mbugwe or Babati to sell their goods. Certain traders from Magugu (notably tobacco and fish peddlers) go on long journeys to sell their goods.¹

Illegal sales.--In addition to the items sold at the Magugu auction, appreciable amounts of Magugu produce are sold in contravention to Government controlled marketing regulations. Hence, both African and Asian traders illicitly solicit trade in rice, corn, millet, onions, and livestock, and consequently it is impossible to determine how much enters these channels of trade.²

¹One tobacco trader travels as far as Tanga to sell his product (see Fig. 57).

²For example, one of the author's African employees, who had asked that his total wages be saved for him until the study was completed, asked for his pay three days before the completion of the field work. He finally admitted he was investing it all in rice. He said he later would transport it to Arusha where he could double his money on the black market. These activities are not confined to Africans and Asians as witness the European who, on a visit to Magugu, requested the author to purchase millet for him in order that the European might make pombe (beer) to sell to Africans---a highly illegal activity.

Because it is inconvenient, and sometimes impossible, to transport products any distance, most of Magugu's produce is sold locally. Black marketing is eventually discovered, so that the African is reluctant to turn to this avenue of increased revenue. As far as could be ascertained, the overwhelming percentage of products sold at Magugu are disposed of legally.

INCOME

Method of determining income.--An attempt was made to ascertain the yearly cash income of each individual farmer at Magugu for 1953. But, like such figures from farmers anywhere, these figures must be treated with caution. Various methods were employed in order to make such figures as reliable as possible. Hence, each farmer was first asked to estimate what he felt was his yearly cash income. Then in turn every phase of his farming operation was discussed in order to find out, for examples, how many bags of rice were sold, or how many animals were sold, how much outside labor was done, or how much handicraft contributed (on a weekly, monthly, and yearly basis). Inquiries were made regarding the amount of beer brewed yearly, and this was checked with the number of brewing permits issued by the Native Authority. Purchasing habits were investigated in the local Asian stores.¹ In addition,

¹It was partially through this latter method that the amount of income from prostitution was determined.

reported income from those working on European estates was checked with the European owners and managers.

Once the farmer had given a tentative yearly income figure plus the actual figure of what he reported he had sold in goods, discussions were then held to determine what was the best figure to use as his total income. Generally this figure corresponds closely to the sum representing the addition of all various sources of income. If anything, the figures used are too high, even though the tendency on the part of the farmer is to give too low a figure. This is the result of getting the farmer to admit small amounts received for a variety of objects. Generally, for example, if one asks how much income is derived from poultry, the figure given is too high, as so very little comes from this source. The same may be said of small sales of fruit, sweet potatoes, sugar cane, tins of millet, corn, and castor beans, or even rice.

To strengthen further the validity of income figures, records were kept on a quantity basis of everything sold. Hence, if a farmer reported income from the sale of rice, the exact number of bags of rice was determined as well as the price normally received per bag.¹ If milk were sold, the number of bottles sold per day, per week and per month was determined. A similar breakdown in units was used for handicrafts, outside labor, beer brewers, and

¹The Magugu farmer seems to find it easier to remember the quantity of goods sold rather than the amount of money received.

all sources of income other than prostitution and that derived from the operation of restaurant stalls.

Estimated and actual income.--The total estimated yearly income of the 395 farmers interviewed was Shs. 80,796/- or Shs. 204/50 per operator. The actual income determined after questioning was Shs. 99,139/- or Shs. 250/98 per operator.

European outside labor.--The largest single source of income for Magugu farmers is outside labor on the nearby European estates. This accounts for Shs. 16,004/- of income and is spread quite evenly over a twelve month period. This not only shows the assistance the community receives from outside sources even after ten years of settlement, but it also emphasizes the fact that perhaps Magugu would not be the successful community it is without this steady and continuing source of income in its formative years. However, in relation to the whole income pattern, this source of income is becoming smaller and smaller, and as the land is more fully utilized it will play a still smaller role. Today this source of income could be removed with little effect upon the farmers, for the energies of these European employees would then, of necessity, be channeled into independent pursuits.

Handicrafts.--The second largest source of cash income to the farmers is handicrafts, which contributes an income of Shs. 15,823/-. A wide variety of activities falls under the heading of handicrafts. They

include basket, mat, and rope weaving; furniture and shoe making; knitting; and the making of clay pots. The Magugu-Babati area is becoming increasingly well known for the type of rugs and mats made, and because Babati has become the central market for these items, many of them are taken there from Magugu. At Babati they are sold both to African wholesalers and travelers along the Great North Road. Some of these rugs are made out of reeds, palms, and sisal and are beautifully dyed. Single rugs bring as much as fifty shillings, but the normal small undyed mat sells from two to five shillings. Most of the work is done by women, old men and children, although in the dry season even the younger men help out. The furniture and shoes made and repaired are primarily for local use by both the Africans and the Europeans. Knitting activities are also directed toward local markets.¹ Clay pots for carrying water, cooking and storing food, and for general household use are extensively made. Although some of these pots are sold elsewhere, the majority of them are also for Magugu consumption.

Castor beans.---The third largest source of income is from the sale of castor beans. This is the only commercial crop raised on a large scale and represents

¹A few of the African men are excellent knitters. The middle-aged African in charge of the upkeep of the Magugu Rest Camp was quite proud of a turtle neck sweater that he had knitted and was wearing.

Shs. 13,376/- of the total income. This is the only figure which differs radically with one of the cross checks used, in this case the Magugu auction reports which listed purchases of Shs. 34,435/- worth of castor beans. However, castor beans are raised extensively by the eight hundred laborers associated with the Dudumera estate, and appreciable amounts are also raised in the Mbugwe chiefdom.

As this is one of the leading cash crops of farmers living just outside the Magugu area, many aliens bring quantities of castor beans for sale at the Magugu auction. In addition, the 575 workers on the nearby European estate often harvest semi-wild castor beans, have small plots of their own on the European estates, or make arrangements with Magugu farmers for harvesting their crops (when the price of castor beans is low, many farmers allow anyone to harvest the beans free of charge). Taking into consideration all these outside influences, the figure of Shs. 13,376/- represents a close approximation of what the 395 farmers interviewed realized from this crop.

Government employees.--Government employees, who, of course, are also farmers, receive Shs. 9,455/- in wages. These wages represent the fourth largest income category. These employees are engaged in many occupations. Some, such as the elders of the village, messengers, market clerk, jailer, and rest camp caretaker, are paid by the Native Treasury. The majority, however, are in the employ of the territorial Government. They are game scouts,

agricultural laborers and instructors (on such projects as the Government experimental rice plots), construction workers (for example, the Magugu school was built in 1953), Public Works Department employees working on the highways, de-flying boys in the tsetse cleansing chambers, dispensary employees, and the local school master.

In general, those employed by the territorial Government represent the economic elite in Magugu. They have steady incomes, finer homes than the average, and do not have to depend upon the vagaries of prices and weather for their incomes. In addition, many are supplied with uniforms and badges of office, both of which are prized by the Africans.

Rice.--The second largest cash crop, but only fifth in value of total cash income, is rice. The total estimated income from this source in 1953 was Shs. 9,169/- (as against Shs. 9,653/- worth auctioned at the market). Nearly the entire sale of this crop is in the form of unhulled rice (mpunga), only twenty-two shillings worth being sold as hulled rice (mchele). A small quantity was auctioned during the months of June, August, and December, but 96 per cent of the crop was sold in the month of July during and just following the annual harvest. As the Government controls the price of rice, the farmer has little incentive to hold his crop in the hopes of greater returns. Furthermore, because the farmer does not seem to be able to anticipate his total annual needs, too much rice is sold

right after the harvest. The result is that before the next crop is harvested most of the farmers have exhausted their supplies and must rely on less desirable foods. The lack of proper storage space also prevents many farmers from storing much of the crop, and that which is stored sometimes becomes infested with weevils, or is damaged by rodents, or rots.

It would seem that there is a need at Magugu for the Government to aid in the construction and management of reserve rice storage graneries such as are now used for corn in many parts of the Territory. In this way the disposition of rice could be spread over a longer period of time enabling more of it to stay in the community where it is needed.

Beer.--The next largest farm income accrues from the brewing of African beer, and this brings in Shs. 7,985/- yearly. Most beer is made from millet and is brewed in old kerosene tins over open fires. It is widely drunk by the Africans; somewhere in Magugu nearly every night there is a beer party, consisting of drinking, drumming, and dancing. Often a beer party is a farmer's answer to his debt problems, for there is considerable net profit to be derived from the manufacture and sale of beer. Because of its popularity and cheapness, it will undoubtedly continue to be one of the main sources of income for the Magugu farmer.

Miscellaneous outside labor.--A variety of outside

labor provides an appreciable amount of income for the Magugu community and represents the last category accounting for over five thousand shillings. Outside labor brought in Shs. 6,489/- in 1953 and was divided between bricklayers, truck drivers, herders, bus conductors, peddlers of fish and other speciality items, employees of other Africans, and laborers in the local Asian shops. Most of this income was derived from African sources (mainly working for other African farmers), but much of it still comes from Asian and European sources. Hence, the bricklayers were nearly exclusively employed in constructing paw paw kilns, houses, and other structures on European estates (see Fig. 141). The truck drivers and bus conductors worked for Asian entrepreneurs, as did the laborers in the local shops. However, because of the great number of African farmers who at one time or another either trade work with their neighbors or work for larger African farmers for a daily, hourly, or piece work wage, the largest single part of this income represents strictly African enterprise. Although the daily African wage paid to another African is quite small, the aggregate is large.

Livestock.--The influence of livestock expresses itself only slightly in the cash income pattern of the community, and livestock yielded only Shs. 3,355/- in 1953. Most of this represented the income of the local butchers who often purchased their animals outside the Magugu community. Occasionally animals are sold by one

farmer to another and more often by a farmer to the local butchers, but there is a tendency to do the latter only when an animal is aged or sick. Hence, the quality of meat offered to the public is generally quite low.

As the transfer of livestock as bride price represents no cash income, this element of the economy is not represented in the cash income pattern.

Onions.--One other cash crop produced a sizeable income in 1953. This was the onion crop that was sold for Shs. 2,600/-. However, only Shs. 219/- worth of this crop was sold at the Magugu auction. The onion growers themselves do not hesitate to tell you that they sell their crop elsewhere at higher prices than prevail at Magugu. Hence, Asian and African traders who possess trucks come to Magugu to bargain for onions whenever the crop is ready. Much of it is then sold in the Arusha-Moshi-Tanga markets at large profits to the wholesaler. Until adequate and cheap transport is available for hire, the Magugu farmer will not be able to take advantage of this price spread and will continue to be at the mercy of either the local auction where the Government does not protect the price or of the sharp traders who possess their own transport equipment.

Corn.--Corn valued at Shs. 1,668/- was sold in 1953. As one thousand shillings of this figure represents corn sold by one man, the village headman, it does not play a significant role in the general cash economy.

Beans, peas, peanuts, sweet potatoes and charcoal.--

To the average farmer the income derived from the sale of native beans and peas, peanuts, sweet potatoes, and charcoal is more important than the income derived from the sale of corn. These items accounted for Shs. 1,162/- worth of income, but they represent a greater number of transactions than does the sale of corn. As they are important items in the diet and life of the farmer, they represent literally thousands of small transactions spread over a twelve months' period. The food crops in this category are those normally found in a tropical subsistence agricultural economy.

Charcoal represents the African's adaptation to an unusual environment created by the removal of all sizeable timber during the clearing operations. Wood is available only at great distances, and rather than carry this bulky item it is converted into charcoal. Throughout the year the fires of the charcoal burners may be seen on the Rift Wall and adjoining non-cleared areas where they risk sleeping sickness and wild game in order to obtain this product.

Millet, butter, goats and sheep.--The sale of millet represents cash income amounting to Shs. 923/-. Only Shs. 110/- of this is auctioned at Magugu; the remainder is sold to the pombe brewers or travelers that pass through. The sale of butter and ghee (Shs. 875/-) is primarily to other Africans, whereas most of the milk (Shs. 268/-) is sold to the European

farmers, few of whom own cattle. Goats (Shs. 837/-) and sheep (Shs. 123/-) are sold mainly to other farmers, but some are purchased by the European estates for slaughter, and some also are sold along the Great North Road or to the livestock auctions at Mbugwe or near Babati. A few goats and sheep are sold to the Iraqw tribesmen who come from above the Rift to purchase these animals for sacrificial purposes, because the Magugu-Mbugwe people have a reputation for producing the finest goats and sheep in this area.

Sunflower seeds and sugar cane.--Sunflower seeds

(Shs. 156/-) are apparently all auctioned at the Magugu market, for they represent the exact amount that was purchased there in 1953. Sugar cane (Shs. 60/-) is sold mainly to travelers at the restaurant stalls on the Great North Road, and it is common to see bus passengers chewing the stalks while waiting for the bus to proceed on its way.

Miscellaneous income.--Much of the income listed under the category of miscellaneous (Shs. 4,925/-) represents that brought in by the tea stalls and small restaurants that are operated by the farmers along the Great North Road. Other items in this category are the sale of bananas, tobacco, wild honey and beeswax, peppers, wild lemon, various profits on trading and transport, the operation of a small hotel by a Maguguite at Makuyuni, and income derived from the headman hiring his oxen for plowing.¹

¹One African at Magugu owns a truck which is for hire.

Prostitution.--Income derived from prostitution is usually hard to determine no matter where it occurs. It becomes even harder in a situation like Magugu where there are no houses of prostitution and where all the women, who are also farmers, operate independently.

Because of the low status of women in Magugu society there is not the great stigma attached to prostitution as there would be in many communities, though they are still looked down upon by most Africans. That prostitution exists on a fairly large scale is supported by the testimony of Asian shopkeepers who state that their best customers are often single women with no known source of income, and by the Africans themselves who class these women as "runners". Many of the prostitutes have been married but have left their husbands for various reasons, and others are quite young girls who have not been married.

There are two main sources of customers for the prostitutes. The main source is the workers on the nearby European estates in both Magugu and Dudumera. Many of these laborers are contract workers coming from a distance without wives or girl friends. As these estates employ more than 1,300 laborers, most of whom are aliens outside the normal moral restraints imposed by their tribal societies, their morals sometimes decline rapidly, and thus they form the main body of customers. A second major source is the travelers along the Great North Road. Cattle herders, who stop nearly nightly with the herds

they are driving to the Arusha markets, and ordinary African travelers on foot and bicycle, find quarters in Magugu at the small African hotel or in the huts of the prostitutes themselves. In addition several Asian farmers and traders as well as European bachelors maintain a mistress or hire the services of women on a nightly basis.¹

It is estimated that Shs. 4,846/- are earned through prostitution. This figure has been arrived at by taking the difference between the estimated yearly income of prostitutes interviewed (who, of course, also had farm income) and that that could be explained in any other way. Hence, if a woman claimed a yearly income of, for example, five hundred shillings but could account for the sale of products valued at fifty shillings and vaguely referred to the remainder of the money as being given to her by "boy friends", it was assumed that Shs. 450/- was earned through prostitution. That the figure, Shs. 4,846/-, is not far from the truth was verified by shopkeepers who estimated a yearly income from sales to prostitutes of about five thousand shillings.

SUMMARY

The people of Magugu, consisting of all farmers interviewed, their wives, children and dependents, plus laborers on European estates and other mentioned small groups, number about 3,000. These people are distributed unevenly over the

¹A situation may arise, as it has at Magugu, where a European farmer is a bachelor and lives with an African woman. Upon eventually marrying a European wife he still maintains the African woman more out of a sense of duty than for sexual reasons

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Magugu area with such factors as soil fertility and nearness to work and friends playing important roles in their distribution.

To cope with the environment at Magugu, various systems of enforced communal labor are resorted to in order to protect the community from the encroachments of the tsetse fly. Additional forced labor is used to insure the maintenance of the irrigation ditch, Magugu's only permanent water supply. Adaptation to the African's physical surroundings also expresses itself in the grazing-herding system that has developed.

Even more important has been the land use methods adopted to utilize best the soils, climate and water resources of the area. This has led to great segmentation of many small fields, the growing of rice, sweet potatoes, and sugar cane under irrigation, and the introduction of non-irrigated drought resistant plants such as millet and cassava.

The gradual development of subsistence agriculture has been strengthened by funds available from outside sources, such as wages of European estate workers or Government employees. Although many of the farmers are strictly subsistence agriculturalists, more and more of them are improving their economic status with the sale of the commercial crops of castor beans and rice or by the sale of handicrafts. Finally, the many diverse activities of the area, ranging from farming to bricklaying, from teastall operators to the traveling trader, are all reflected in the total cash income received by the community.